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Collaborative learning experience in project groups : an analysis of collaborative process and discourse patterns in peer discussions of college students in Hong Kong

Collaborative Learning Experience in Project Groups: an Analysis of Collaborative Process and Discourse Patterns in Peer Discussions of College Students in Hong Kong

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Abstract

This study aimed at obtaining an in-depth understanding of the collaborative learning experience of the college students in Hong Kong while engaging in doing their final year group projects. It focused on group processes, group dynamics, and the interactive patterns among members in group discussions. Three sets of data: (i) group discussion sessions; (ii) individual student interviews; and (iii) students' personal reflective writings; were used for analyzing: (i) the role interdependence among members in the groups; (ii) the cognitive reasoning exhibiting in the group discussions; (iii) conflict management of the project groups; and (iv) students' overall perceptions on their group experience. The data sets were triangulated to provide the genuine contextual knowledge of the experiences, views and perceptions of students who had gone through the process of group learning.

The findings suggested that role structure within a group would affect its communication pattern. Project groups with a higher proportion of members taking on the task roles tended to engage with the multiple interactions pattern, of which the interaction level and degree of involvement among members tended to be higher. The findings also suggested that traits of high-level cognitive reasoning had occurred in the project groups, and the associated discourse forms were exploratory questioning, elaborative explanation, problem solving and decision.

Group conflicts and disputes, which were mainly substantive and procedural in nature, seemed to be rare and minor, and could be resolved by a number of strategies. Overall, students perceived their group experience as positive. They treasured the group togetherness in working as a team on striving for a common goal. With the specific role functions, the Leaders had more complex encounters and perceptions of their experience in the project groups. The Leadership issue deserves a more in-depth examination.

Overall, this study has affirmed with what the literature said, and at the same time has extended the understanding of the collaborative learning process of students in Hong Kong. Its findings have provided pedagogical implications and insights for teaching in a number of aspects.

Acknowledgements

The Dissertation handbook said the acknowledgment part is optional, but I definitely do not want to miss this chance in expressing my heartfelt thank to my thesis supervisor, Dr. Lisa Lucas, for her continuous help and advice on my study.

Dr. Lucas has enlightened me on the issues that a reliable research should consider. She has given me much advice on the research design, letting me have a clear idea on the research methodology and rationales. I am particularly impressed by her continuous reminder on alerting me of the complexities of group dynamics, be cautious of putting in too much assumptions, and not rushing to absolute statements without substantial evidence. These are very useful advices for doing qualitative studies. Dr. Lucas has also given me a lot of emotional support. The works submitted were always returned with constructive and encouraging remarks, not to mention all the corrections of technical inaccuracies. My heartfelt salute and thank to Dr. Lucas!

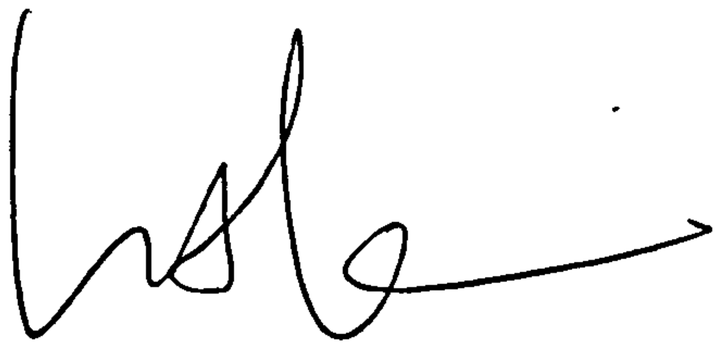
The study process was long, tedious and full of hurdles. But there were clouds around me – my family members, my friends, my colleagues, and also God. They are the members of my cheering team.

DECLARATION

I declare that the work in this thesis was carried out in accordance with the Regulations of the University of Bristol. The work is original except where indicated by special reference in the text and no part of the thesis has been submitted for any other degree.

Any views expressed in this thesis are those of the author and in no way represent those of the University of Bristol.

The thesis has not been presented to any other University for examination in the United Kingdom or overseas.

Signed: 

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Chapter 1: Introduction and Background

1.1 Motivation of Study

I identify with the view point of John Dewey (1940, 1966), one of the most influential philosophers, that school education is to provide a social environment for students to foster interpersonal communication. By interacting with others, students would learn socially appropriate behaviours, and they also learn to cooperate and work together with other people. I also agree with Vygotsky's (1978) social constructive perspective, that by interacting with peers, students are able to complete tasks they cannot do alone. In my view, learning is not merely a construction process taking place in the mind of an individual, but also a socially constructed activity (Salomon & Perkins, 1998).

It is the trend in contemporary education that more and more student-centred learning activities, collaborative working modes and authentic learning contexts are provided to enhance students' learning experience through the sharing of knowing and thinking. Many educationalists believe that collaborative learning is an effective means in fostering learning, promoting high level thinking, and enhancing social behaviour (Cohen, 1994). The benefits of collaborative learning accrued to students are said to out-perform traditional classroom teaching in many ways (Slavin, 1995; Johnson et al., 2000).

Collaborative learning has become more and more valued under the current educational reform in Hong Kong. Collaborative learning is promoted as an effective pedagogy for both classroom teaching and out-of-class learning. Peer learning through project groups has gained its values and significance at all levels of education in Hong Kong. Project-based learning has become a common teaching pedagogy in colleges and universities. The projects are usually course-based, can be short term or long-term, spanning over a semester or a whole year.

As the final year project supervisor for several years in a post-secondary college in Hong Kong, I have been involved in engaging students to learn as a group in taking up the final

year projects. I supervise the project groups by meeting them weekly, to check the groups' working progress, to offer assistance, to give advice, and to provide feedback on their work. The project groups take on their own discussions outside class and without my presence.

Without the teacher's presence, what is happening in the groups? What kinds of peer interaction actually take place in the collaborative groups? In what manner are collaborative discussions delivered in the groups? What kind of cognitive collaborative dialogues are members engaged in? Have conflicts and disputes occurred among the group members, and how the conflicts are resolved? What are the perceptions of students on the group process? These are all in the black box. To search for answers to these questions motivates me to launch this study. It is not my intention to measure how effective collaborative learning is. I just want to make the black box of group learning more transparent; so that those engaging in teaching and supervising student project groups can obtain a more in-depth understanding on how students learn as a group, and the kinds of interaction occurring in their collaborative learning process. I believe the findings will provide pedagogical insights for collaborative learning at the postsecondary level.

1.2 The Hong Kong Higher Education System

1.2.1 Rapid expansion and the new educational system

In Hong Kong, higher education developed at a slow pace before the 1980s. The University of Hong Kong was established in 1911. Not until 52 years later in 1963 was the Chinese University of Hong Kong established. In 1988, the Hong Kong University of Science and Technology came into place. After that, Baptist College, Hong Kong Polytechnic, City Polytechnic, and Lingnan College, were turned into universities.[1] Shue Yan College was approved with the status of university in 2008. As at 2010, there are

[1] Polytechnic University and City University obtained the university status in 1994, Baptist University in 1995, and Lingnan University in 1997.

altogether eight universities in Hong Kong.

Over the past two decades, the higher education sector in Hong Kong has grown significantly. The expansion has its root in the 1989 Policy Address by the Hong Kong Governor (*Sir David Wilson*). In view of the possibility of losing quality people due to the growing trend of emigration and studying abroad, the Hong Kong Government decided to accelerate the development of higher education by increasing university places. It was to prepare for the likely loss of expertise near to 1997 (Morris et al., 1994). In 1981, only 2.2% of the 17-20 age group could enter local universities. This population had increased dramatically to 18% in 2001 (c.f. the Sutherland Report, 2002).

The expansion of higher education was further accelerated with the direction set in the Chief Executive Policy Address (*Mr. Tung Chee-hwa*) in 2001:

> "In the course of our restructuring, one of the Government's most fundamental tasks is to make significant investments in education to prepare each one of us for the advent of the knowledge-based economy."
>
> (*The Chief Executive Policy Address*, October, 2001)

With this direction, the target of the 17-20 age group receiving post-secondary education and training was revised to 60%. Setting up community colleges to offer sub-degree programmes was the way to cater for the increase of post-secondary intakes. Some community colleges had been operating under the universities for a number of years, and some were new institutions.[2] In 2006-07, the total number of the 17-20 age group receiving post-secondary education is 128,000, 64% of the relevant age population.[3]

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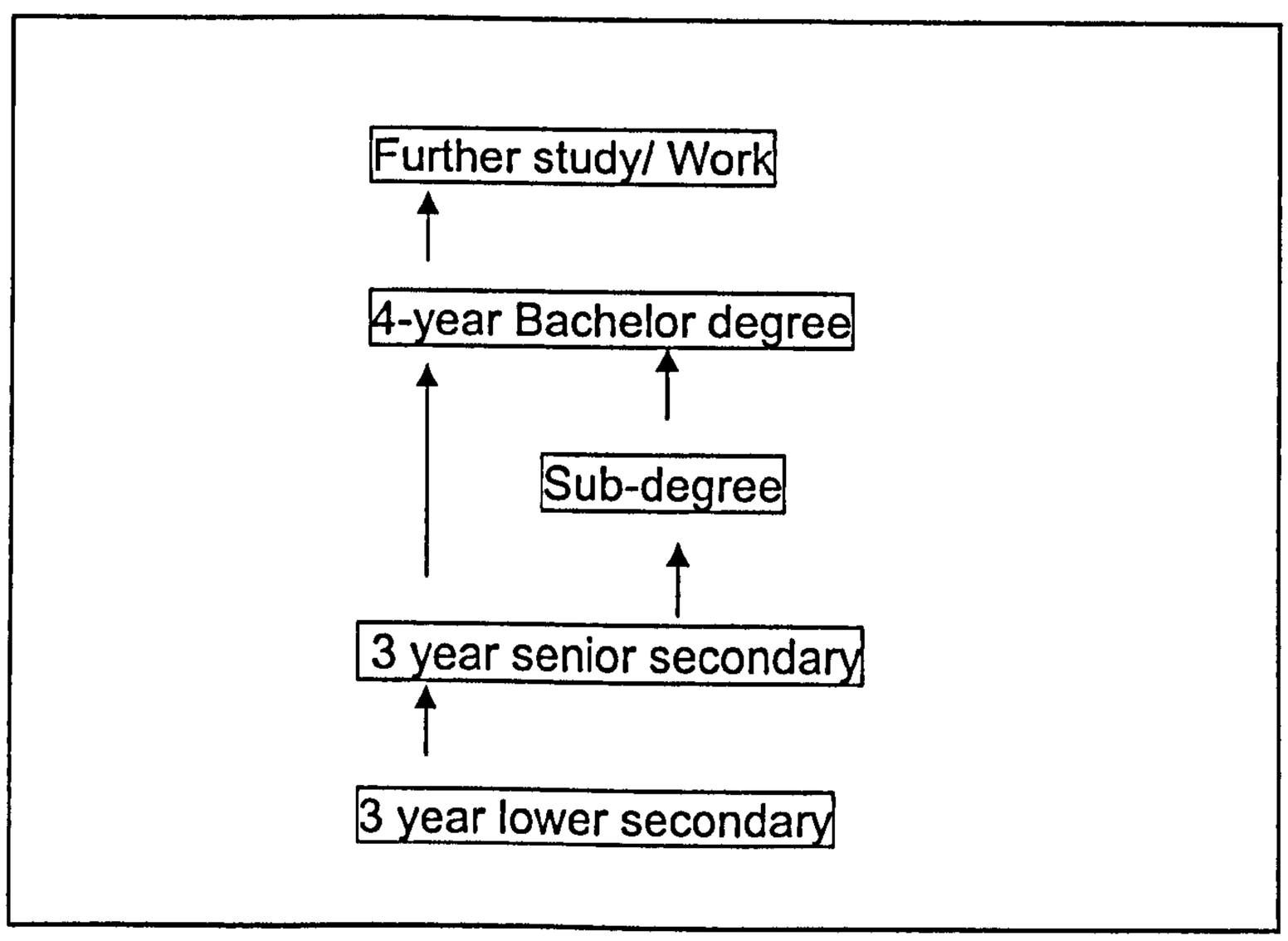
[2] The HKSAR Government does not provide funding to the new community colleges. For colleges that were operated under universities, funding was withdrawn from 2005-06 onwards. All community colleges in Hong Kong are now self-financed.

[3] "*Summary of the Review on Higher Education Sector- Second Stage*", document submitted to Legislative Council by the Education Board, HKSAR, April 2008.

The most recent educational reform initiative is the so-called "3+3+4" structure, in which students will receive 3 years lower secondary and 3 years senior secondary education, then 4 years of university education. The current two high-stake examinations, the Hong Kong Certificate of Education Examination (HKCEE) and the Hong Kong Advanced Level Examination (HK A-Level), will be combined and replaced by the Hong Kong Diploma of Secondary Education Examination (HKDSE), which will be taken at the end of the senior secondary stage.[4] This new structure will affect the intakes of universities from 2012-13 and thereafter. The re-structured educational system of Hong Kong is presented in Figure 1.1.

Figure 1.1: <u>The new educational system of Hong Kong from 2012 onwards</u>



This structural change will bring both opportunities and challenges to universities and colleges. The overall educational mission and its related teaching pedagogies will need to be reframed and repositioned. One significant agenda is to redefine teaching and learning.

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[4] Proposed in the "*The New Academic Structure for Senior Secondary Education and Higher Education – Action Plan for Investing in the Future of Hong Kong*", the Education and Manpower Board, HKSAR, May, 2005.

For some colleges and universities in Hong Kong, pedagogies such as reflective teaching and learning, problem-based learning, collaborative group learning and so on, have become the basis of re-positioning teaching and learning for meeting the new educational mission.

1.2.2 The new educational mission and pedagogies redefined

Hong Kong is a highly commercialized society. Education planning is largely determined by human resources planning (Bray, 1997; Cheng, 1997), such that education missions are always functional, aligning with the economic and prosperity of the society. The "*2000 Review of Education System: Reform Proposals: Educational Blueprint for the 21st Century*" (Education Commission, HKSAR, 2000) also stated that the mission of higher education was to contribute to the economic growth of Hong Kong by providing high quality training for people:

> "Higher education is to train up quality people to contribute to the economic growth of Hong Kong and the development of a stable and harmonious society."
>
> ("*2000 Review of Education System: Reform Proposals: Educational Blueprint for the 21st Century*", Section 5.4.4)

"*The New Academic Structure for Senior Secondary Education and Higher Education- Action Plan for Investing in the future of Hong Kong*" (Education and Manpower Bureau, HKSAR, May 2005) has provided a similar view that education was to contribute to the development of a knowledge-based economy:

> "Globalization, the explosive growth of knowledge, the advent of information technology, and the development of a knowledge-based economy are leading to unprecedented worldwide changes. Hong Kong's cultural, social and economic developments depend on whether the population can rise to these challenges and make the best use of the opportunities ahead."
>
> ("*The New Academic Structure for Senior Secondary Education and Higher Education- Action Plan for Investing in the future of Hong Kong*", Section 2.2)

In several official documents, it was suggested that the means to achieve the mission were: multi-disciplinary learning experiences, problem-solving, multiple abilities, diversified learning, teaching and assessment, and so on. The following are some of the statements:

> "to provide students with **multi-disciplinary learning experiences**, which will broaden their knowledge base and vision, as well as their **problem-solving power** and adaptability"
>
> (*2000 Review of Education System: Reform Proposals: Educational Blueprint for the 21st Century*, Section 5.4.3)

> "We should help students explore their **multiple abilities**, ... We should also help students to make use of **different abilities** simultaneously to learn effectively." (Ibid, Section 5.6.2)

> "**Diversified learning**, teaching and assessment should be used to suit the different needs, interest and abilities of students. All students should be provided with an enabling environment conducive to their development as **self-regulated** life-long learners."
>
> (*The New Academic Structure for Senior Secondary Education and Higher Education – Action Plan for Investing into the Future of Hong Kong*, May 2005, Section 2.14)

Notions like "*multi-disciplinary learning*", "*problem-solving*", "*multiple abilities*", "*diversified learning*", "*self-regulated learners*" etc, seem to be best achieved through collaborative learning in peer discussions (Johnson & Johnson, 1989, 1996a, 1996b; Chan, 2001; Peters & Alderton, 2003; Sawer and Berson, 2004).

Under the current educational reform, collaborative learning through project groups is recommended as a means in helping students to achieve "*Learning to Learn*". Project learning is encouraged because it provides students with diversified learning experiences, and enables them to integrate multiple abilities regarding knowledge, skills and values:

> "Project learning enables students to connect knowledge, skills, values and attitudes to construct knowledge through a variety of learning experiences."
>
> ("*Learning to Learn – the Way Forward in Curriculum Development*", Curriculum Development Council, HKSAR, 2001, p.87)

"*Learning to Learn*" has been identified as the theme of curricular reform in 2001. In aligning with this goal, project learning is chosen as one of the key tasks in the reform. The advantages of project learning are identified as helping students to build up their problem solving ability by using different information and from different perspectives. The project learning process will result in fostering students' generic skills, critical thinking, creativity, and collaborative skills:

> "building up students' capacity of 'Learn to Learn' through the process of identifying topic or a problem, collecting and organizing relevant information, exploring and analyzing the problem from different perspectives, and finally drawing a conclusion and making a product. Project learning also serves to foster students' generic skills, such as critical thinking, creativity, collaborative skills etc."
>
> ("*Personal, Social and Humanities Education – Project Learning Manual*", Education Department, HKSAR, 2002, p.i)

In Hong Kong, college and university students are increasingly required to work cooperatively and to learn collaboratively in groups and teams. The increased emphasis on group learning is responding to the societal changes on team work in the business sector. Requiring students to do group projects in their final year has become a common pedagogy. In the college where I am working, over 90% of the programmes adopt the final year project as a pedagogical means to maximize student learning through collaboration with their peers. In doing group projects, students need to go through the process of identifying a topic or problem, collecting and organizing relevant information, exploring and analyzing the problem from different perspectives, resulting in drawing a conclusion or making a product.

In Hong Kong, student project experiences are valued and seen as pedagogy in fostering students' capacity of "Learning to Learn". Student projects that require a team approach are very common in colleges and universities. With the growing importance of project learning in the Hong Kong educational scene, it is worthwhile to launch a study to see the kinds of interaction and collaborative experiences that students have.

This study will provide an understanding of the typicality of collaborative process taking place in the college students in Hong Kong. It aims at describing the interaction processes and learning experiences of students engaging in project groups, and hopefully drawing insights that might inform teachers who engage in teaching or supervising student project groups.

1.3 Advantages of Collaborative Learning

Collaborative learning is valued in Hong Kong and recommended by educationalists globally, because it is said to have a number of advantages and possibly be contributive in fostering learning, enhancing learning partnership, and developing positive attitude for students.

1.3.1 Collaborative process in fostering learning

There are generally three types of teaching and learning used in the educational environment (Peters and Armstrong, 1998):

(i) Teaching by Transmission, Learning by Reception – information is transmitted from the teacher to the student.

(ii) Teaching by Transmission, Learning by Sharing – flow of information still emanates from the teacher, but can flow from student to student as well.

(iii) Collaborative Learning – teacher relinquishes the role of principal source of information and its transmission to students.

Peer collaboration is seen as a means in fostering learning for it involves the process of articulation, conflict, and co-construction. Some research studies shows that collaborative learning can promote a range of educational outcomes, including higher levels of achievement (Slavin, 1996), better understanding of text (Fall & Chudowski, 2000), higher order thinking (Cohen, 1994), improved communication and conflict management (Johnson & Johnson, 1996), and strategic problem-solving skills (Barron, 2000). The

findings suggest that when students discuss, their ideas regarding relevant concepts of a given group task can rise to new cognitive levels. Collaborative process can turn into the co-construction of ideas that students may have not been able to achieve without social interaction (Roschelle, 1996; Vygotsky, 1962). Vygotsky (1978) pointed out that intellectual ability develops through participation in joint activities. It is through interactions with others that students are able to expand their thinking, broaden their conceptual knowledge, and express themselves in language.

The purpose of collaborative learning is for "the participants to make use of each other's talents to do what they either could not have done at all or as well alone" (Wildavsky, 1986, p.237). Through working in groups, students can enhance the ability in setting goals, delegating work, and dealing with conflict (Colbeck, Campell, & Bjorklund, 2000). They can also improve the communication, leadership, problem solving, and technical skills. The collaborative group project creates a forum that allows students to take an active approach towards their own learning. The security of working within a group provides an excellent entrée into the progression to independent and autonomous learning (Maguire & Edmondson, 2001).

1.3.2 Collaborative process in enhancing learning partnership

Students in the collaborative groups are considered as collaborative learning partners who interact and work together to advance their learning. Collaborative learning partners have an intense relationship centred on mutual goals (Saltiel, 1998, p.6). As Baldwin & Austin (1995) pointed out,

> "Collaboration works best when partners/team members share a common mission, have clear goals, define operating guidelines, provide mutual support, and work in an atmosphere of trust, respect, and affection"
>
> (Baldwin & Austin, 1995, p.55)

The elements of relationship between collaborative partners in learning are as follows (Saltiel, 1998, p.8):

- Shared goal or purpose
- Trust, respect, and loyalty
- Personality traits and qualities that are complementary
- Respect for each other
- Synergy between the partners
- A valued relationship

Collaborative learning partners support each other. Members' roles may be predefined, or may evolve as the process goes on. Such partner relationship is said to empower student learning in achieving more than they set out to do as individuals.

1.3.3 Collaborative process in developing positive attitude

Collaborative group learning is considered as having impact on attitude development of students. Some scholars hold the view that collaborative learning promotes positive attitudes in learning. It is because when collaborating with other members, students can learn the norms of their reference groups, commit themselves to adopt the desired attitudes and behaviours, be exposed to visible and credible social models, and advocate attitudes and behaviours to others (Johnson, Johnson, & Smith, 2007).

Johnson and Johnson (1989, 1999, 2006, 2007) have strong aspiration on collaborative learning because they see collaborative learning bringing about positive attitude, which brings about the internalizing of values, including commitment to the common good, contributing a fair share of work, respect for other's effort, developing multi- dimensional views of self and others, and achieving mutual success. As said, students' positive self-perceptions, self-esteem, self worth and self-acceptance are outcomes of positive attitude development. Johnson and Johnson (2007) described students benefited from developing positive attitude through collaborative learning as follow:

"The more efforts students expend in working together, the more they tend to like each other. The more they like each other, the harder they tend to work. The more individuals work together, the greater tends to be their social competencies, self-esteem, and general psychological health."

(Johnson and Johnson, 2007, p.21-22)

1.4 Major Aspects of Collaborative Learning

Construction of shared meanings is the essence of collaborative learning. Some studies found that construction of shared meanings is associated with high-level interaction, collaborative inquiry, productive discourse (Roschelle, 1996), sharing cognitive responsibility of the task, and positively taking on the role of collaborative learning partners (Baldwin & Austin, 1995; Saltiel, 1998). The various descriptions on what constitutes collaborative learning in the literature can be summarized into two major aspects: (i) positive interdependence; and (ii) high-level cognitive reasoning.

1.4.1 Positive Interdependence

The social aspect seems to be the most salient to collaborative learning. It means that one needs to know how to work with the other members in order to learn effectively from peers. It is said that working cooperatively with other students provides more learning from peers, and is more likely to communicate ideas, concepts and methods in readily understandable ways (Slavin et al., 1995). In peer interaction, group members will possibly tackle cognitive conflicts and dispute ideas in achieving decision making, constructing shared meanings, and thus arriving at the completion of a task.

Positive interdependence, a major notion of collaborative learning, is defined as the "interdependence among members (created by common goals) that result in the group being a dynamic whole" (Johnson, Johnson & Smith, 2007, p.16). Promotive interaction occurs in a group that exhibits positive interdependence. Promotive interaction refers to group members being able to "encourage and facilitate each other's efforts to complete tasks and achieve the group's goal" (Ibid, p.24). It requires "mutual help and assistance, exchange of needed resources, effective communication, mutual influence, trust, and

constructive management of conflict" (Ibid, p.17). A group is identified as having promotive interaction if its members have the following behaviours (Johnson and Johnson, 1989, 1992, 2009; Cohen, Chang & Ledford, 1997; Chemers, 2000; Johnson, Johnson, and Smith, 2007):

- Help and assist each other;
- Exchange the required resources, information and material;
- Provide each other with feedback;
- Challenge each other's conclusion and reasoning;
- Advocate working harder to achieve the group's goals;
- Influence each other;
- Act in trusting and trustworthy ways.

Group processing skills are required for achieving positive interdependence. Group processing is to find out which actions are helpful in achieving the group's goals and maintaining effective working relationships. Group processing includes the following aspects:

- Division of roles (Boremann, 1990; Cohen, 1994; Lewis, 1997);
- Conflict management (Johnson, Johnson & Smith, 2007);
- Quality of decision making and the process of achieving consensus (Johnson, Johnson & Smith, 2007);
- Gender (Strough and Berg, 2000) and friendship (Strough, Berg and Meegan 2001).

1.4.2 High-level cognitive reasoning

A key issue in studying collaborative learning is to understand how problem-solutions are jointly produced in dialogues. This process can possibly be described as one by which knowledge is co-constructed by a process of negotiation (Nguifo, Baker & Dillenbourg, 1999). In collaborative interactions, when confronted with discrepant ideas, students have

to explain, clarify, justify, and argue for their position. This will provoke members to engage in deep processing (Chan, 2001). Research studies demonstrated that successful learning groups were usually associated with high-order thinking and interpretative talk (Teasley, 1997), collaborative inquiry (Coleman, 1998), and co-construction of explanations (Kuhn et al, 1997; Okada & Simon, 1997). The discourse patterns associated with cognitive reasoning are exploratory questioning (King, 1991; King et al., 1998), elaborated explanations (Webb & Favivar, 1994; King et al.; 1998), and collaborative argumentation (Chinn & Anderson, 1998; Chinn et al., 2000).

In collaborative discussions, students coordinate the diverse skills and abilities of their group members to address a complex task. Argumentation, for example, is argued as a tool for fostering reflection and deep thinking. Such a collaborative process tends to result in higher achievement, and more frequent use of higher-level reasoning and meta-cognitive thought (Johnson, & Johnson 1989; Johnson, Johnson, & Smith, 2007).

1.5 Aims of Study

My motivation in conducting a study on collaborative learning experiences of college students in Hong Kong is based on both a macro and micro perspective. In terms of the macro level, there is growing importance and more extensive use of group projects in the higher education sector in Hong Kong brought about by the reframing and repositioning of teaching pedagogies. At the micro level, I am personally involved in teaching courses involving collaborative learning. I do not mean to evaluate how effective collaborative learning is. This study does not intend to measure how collaborative learning imposes effective or ineffective learning outcomes. But as a college teacher who has been involved in supervising student project learning groups for a number of years, I notice that little attention is given to the teaching of group processes. Both the teachers and students tend to emphasize project content and overlook process dynamics. Academic staff supervising student project groups may have little experience and expertise to develop and assess the process of team work. I feel there is a need to acquire more information in order to help students in attaining successful learning experiences in doing

group projects. This is the reason why I chose to do a study on the collaborative learning process. The study aims at providing a more in-depth understanding of collaborative learning from two major perspectives:

(i) *Positive interdependence among members in the group:*
The purpose is to understand the group processes and peer interactions in terms of role interdependence and members' perceptions on the group experience. (*Discussions provided in Chapter 4 and Chapter 7*)

(ii) *High-level cognitive reasoning exhibited in group discussions:*
The purpose is to describe the phenomena and discourse patterns in group discussions, including exploratory questioning, elaborative explanation, cognitive argumentation and conflicts, problem solving and decision making. (*Discussions provided in Chapter 5 and Chapter 6*)

The participants were 3 project groups comprising 4-5 members each. The groups were engaged with a semester long project in their final year of associate degree study. Three types of protocols were used as the data source:

(i) individual student interview;
(ii) students' written retrospective reflections;
(iii) taped group discussion sessions.

The data will be triangulated to answer three questions:

1. Does role structure impact on the collaborative process of the student project groups?
It is to understand the role structure in the project groups, and to see to what extent that role composition will affect group norms, communication patterns and behaviour level of members in the project groups.

2. **Does high-level cognitive reasoning occur in the student project group discussions, and in what discourse forms?**

   It is to explore whether members are engaged in high-level cognitive reasoning, and what kinds of discourse forms are used in the discussion dialogues.

3. **How are conflicts managed in student project groups, and what is the perception of individual members on their group experience?**

   It is to examine the nature of conflicts and the ways of resolving them in the project groups. It is also to see the kind of perception that students have on their group experience and collaborative process.

The answers to the above questions will give rise to insights on some pedagogical implications for helping student learning groups to attain better collaborative learning experience.

Following this introduction is the literature review chapter. The collaborative learning literature, in particular that related to group processes (e.g. role structure, conflict management, group development etc.), and cognitive reasoning (e.g. conversational analysis of questioning, explanation, argumentation, problem solving etc.) will be discussed. The methodology chapter will give a detailed account on the research approaches, data collection methods, participant selection, coding methods and so on. As the researcher of this study is also the teacher of the participants, a section on ways to handle this research relationship issue is also provided in the methodology chapter.

Chapters 4, 5, 6, 7 are the core chapters on data discussion. Chapter 4 will begin by looking at the role structure and role interdependence among members in the project groups. The role types, group norms, and interaction patterns identified from this chapter help to lay the ground for the subsequent discussions of cognitive reasoning and conflict management in the groups. Chapter 5 will extend the analysis of the dialogue interactions in group discussions to see whether and how cognitive reasoning is taking place. Chapter

6 continues to look at dialogue interactions, but from a different angle: the argumentation and conflicts occurring in the groups. Chapter 7 will provide an account of how students feel and perceive when having gone through different stages of the collaborative group work process. Chapter 8 is the concluding chapter, in which the research questions are returned to, pedagogical insights are provided, and future study development will be discussed.

Chapter 2 : Literature Review

2.1 The Concept and Definition of Collaborative Learning

Teamwork, when applied to education, has come under many different labels. "*Collaborative learning*" and "C*ooperative learning*" are the most well known ones. The two terms are often used interchangeably. Different researchers are associated with each one of these terms. For example, Johnson and Johnson (1996a, 1996b, 1996c), Sharan (1994), and Slavin (1985, 1995, 1996) used the term "cooperative learning", while many others used the label of "collaborative learning" (e.g. Webb, 1995; Roschelle, 1996; Teasley, 1997; Dillenbourg, 1999).

Some researchers have tried to distinguish the two concepts by arguing that collaborative learning has its root in the UK and focuses on exploring ways to help students take a more active role in their own learning; while cooperative learning has its root in America stressing the social nature of learning (Bruffee, 1995; Roschelle and Teasley, 1995; Panitz, 1999). Collaborative learning is said to highlight individual members' abilities and contributions, empowering students within the learning situations, and is less structured. Cooperative learning adopts a structured learning approach which is defined by a set of processes. It is more directive and closely controlled by the teacher. Bruffee (1995) held the view that cooperative learning was more appropriate for use with primary and secondary school students for it was suitable for learning facts and formulas; while collaborative learning was better suited for university and college students for it is suitable for higher order knowledge and critical learning approach.

To me, such a distinction is artificial and unnecessary. The literature reflects that cooperative learning and collaborative learning are interchangeable terms, and they share a lot of commonalities. Both concepts are being used in higher education studies. Johnson, Johnson and Smith (1991) have established a definition of cooperative learning by

identifying five basic elements: (i) positive interdependence; (ii) face-to-face promotive interaction; (iii) individual accountability; (iv) social skills; and (v) group processes; which I do not find to be any different from collaborative learning.

Dillenbourg (1999) has also provided a detailed account of the meaning of collaborative learning by listing a number of elements associated with it:

- "different forms of interaction: face-to-face or computer mediated."

  (Dillenbourg, 1999, p.2)
- "the activity is joint problem solving." (ibid, p.6)
- "expected to have common goals." (ibid, p.10)
- "division of labour among group members." (ibid, p.11)

It appears that there is no significant difference between the two concepts. Hence, this study will not make a differentiation between these two terms. For the sake of consistency, "collaborative learning" will be used as an umbrella term for the type of educational experience involving joint intellectual efforts by students. In this study, collaborative learning is defined as follows:

- Students working in groups, mutually searching for understandings, solutions, meanings, or creating a project.
- The mutual exploration, meaning-making, and feedback can foster learning, and lead to the creation of new understanding.
- Positive interdependence with role distribution and group processing skills is built into collaborative learning.
- Construction of meanings involves interactive dialogues and peer discussions with others, and can be characterized by a joint commitment to a shared goal.

In this study, collaborative learning does not mean just putting students together to talk and dividing tasks among members. It means "coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of the

problem." (Roschelle and Teasley, 1995, p.70), and it is a "student coordinated activity to solve problems" (Chan, 2001, p.443).

2.2 Seminal Work in Collaborative Learning

Whether termed as "cooperative learning" or "collaborative learning", over the past decades educational research studies have consistently demonstrated that different aspects and various degrees of collaborative groups help students learn (Roschelle, 1996; Slavin, 1996; Pea, 1993; Dillenbourg, 1999). Since the 1970s, David Johnson and Roger Johnson launched a number of studies to demonstrate that greater learning was resulted in cooperative learning than competitive and individualistically- structured environments (Johnson and Johnson, 1974, 1979, 1989, 1996c, 2003b). In 1981, Johnson and colleagues published results of a meta-analysis on the effects of cooperative, competitive and individual learning on achievement. They concluded that cooperation promoted higher achievement and productivity than competition or working individually. The findings were consistent across a wide range of subjects including language, mathematics, social studies etc.

Johnson and Johnson (1985) found that the promotion of high-quality cognitive strategies, constructive management of controversy, sharing and processing of information, interaction between students, and positive attitudes, were variables pertaining to higher achievement in collaborative learning groups. Their studies proved that cooperation (or collaboration), compared with competitive and individualistic efforts, tended to result in higher achievement, greater long-term retention of what was learned, more frequent use of higher-level reasoning and meta-cognitive thought, more accurate and creative problem-solving, more willingness to take on difficult tasks and persist in working toward goal accomplishment, more intrinsic motivation, more transferring of learning from one situation to another (Johnson and Johnson, 1989; Johnson, Johnson and Smith, 2007).

The Social Interdependence Theory proposed by Johnson and Johnson has provided a framework to understand the positive attitude development and social context of motivation. Individual accountability affects motivation. Motivation decreases when group members see their efforts as non essential for group success (Johnson and Johnson, 2003a). Motivation is also influenced by the meaningfulness, incentives and reasons for accomplishing the goal. According to Johnson and Johnson (2003a), there are five reasons for members to work together to maximize the mutual benefit and to achieve shared meaning (Johnson and Johnson, 2003a, p.147-149):

(i) Cooperation empowers an individual to achieve goals that he or she cannot achieve alone.
(ii) Peer pressure as energizer to engage and achieve the task.
(iii) Working to benefit others and the common good will result in the goals being seen as more meaningful.
(iv) Motivation increases when one's goals are interdependent with those of significant others.
(v) Linking personal goal to group aspiration.

The benefits of collaborative experience in fostering high level cognitive reasoning and enhancing good social competencies are very important. Self esteem, self acceptance, positive and multi-dimensional view on others and motivation, which are phenomena of psychological health, are outcomes of collaborative experience for students. Such experiences are especially beneficial to university and college students in developing their civic values and social responsibility.

Johnson and Johnson (2003a) pointed out that, "demonstrating the transition from self interest to mutual interest is one of the most important aspects of social interdependence theory" (p.144) .This transition involves positive interdependence, individual accountability (individual's contribution), social and group processing skills (leadership, decision making, trust building, communication, conflict management, and effective working relationship among members) (Johnson and Johnson, 1992, 1996a, 2003a, 2006,

2009; Johnson, Johnson and Smith, 2007).

The ground breaking work of Johnson and Johnson in collaborative learning has laid a solid foundation for many other studies on group process and peer learning thereafter. Their works have also set for my study a bearing on looking into two major aspects of collaborative learning: (i) positive interdependence; and (ii) high-level cognitive reasoning.

There are many studies arguing that collaborative learning contributes in improving students' attitudes towards learning and working with others in various subjects such as mathematics (Webb, 1991; Fuchs et al., 1997), computer studies (Webb, Ender, & Lewis, 1986), and sciences (Cohen, 1994). Brufee (1999) examined learning among college-level students in a setting where they were divided into small groups to do an assigned group task, and he identified the "craft of interdependence", with which he argued that collaborative learning was possibly to provide students with an opportunity to work together and to learn to construct knowledge. Other studies attempted to demonstrate that collaborative learning may help in promoting conceptual change of students (Pea, 1993; Hoyles and Forman, 1995; Roschelle, 1996; Dillenbourg, 1999). Some pointed out that it could promote a range of educational outcomes, including higher levels of achievement (Slavin, 1996), better understanding of text (Fall et al., 2000), higher order thinking (Cohen, 1994), improved communication and conflict management (Johnson & Johnson, 1996c), strategic problem-solving skills (Barron, 2000), and multilateral communication (Sharan, 1980). Some held the view that collaborative learning was effective in strengthening and promoting achievement in higher education (Slavin, 1985; Johnson, Johnson, & Smith, 1991; Meyers, 1997).

These studies tend to demonstrate that students engaging in collaborative learning may achieve positive outcomes like: (i) effort to work toward goal accomplishment; (ii) positive interpersonal relationships; (iii) psychological health (Johnson, Johnson and Smith, 2007). However, changes in individuals are difficult to measure. They neither involve a single factor or with simple conditions. As pedagogy, collaborative learning has

a basket of advantages, but it is not magic or myth, and does not necessarily bring about dramatic changes for students within a short period of time. For my study, measuring student change is not my intent. What I aim at is to understand and describe students' group learning processes by analyzing the role structure within the group, cognitive reasoning and conflict management when taking on group discussions, and students' perception and experience during different stages of group development.

2.3 Studies on Peer Interaction and Group Processes

David Johnson and Roger Johnson have developed a comprehensive structure on "Social Interdependence Theory" (1992, 2006, 2009), which is a useful framework for understanding peer interaction and group processes for collaborative learning. Positive interdependence refers to students promoting and facilitating each other's efforts to learn in a group (Johnson, Johnson and Smith, 1998a, 1998b).

2.3.1 Group roles and role interdependence

Role interdependence, an element of the Social Interdependence Theory, is a way to establish interdependence in a cooperative setting, and to describe how group members interact with each other. The issue of social roles is an important perspective in studying collaborative learning. Both Cohen (1994) and Lewis (1997) suggested that the role and status of an individual within a group might determine the individual's level of participation in collaborative groups. Group members with higher status were found to participate more.

Group roles in this study refer to functional roles which emerge as a result of members' behaviours in the group. Galances and Adams (2010) defined group roles as follows,

> "(group roles) reflect the traits, personality characteristics, habits, and preferences of the members in a particular group. They are not specified in advance, but emerge from the interaction among members."
>
> (Galances and Adams, 2010, p. 125)

Roles are "a set of expectations governing the appropriate behavior of an occupant of a position toward occupants of other related positions" (Johnson and Johnson, 2009, p.15). Once a role is assumed, the member is expected to behave in certain ways. Group roles contribute to the social equilibrium of the collaborative learning group processes. Roles in a group are in some ways similar to roles in a play. They are the part that group members take as they interact. Different roles concur to make the group operate. Roles can be deliberately created, and can evolve and emerge as the groups develop.

A few decades before, Kenneth Benne and Paul Sheats (1948, 2000) proposed a role typology to differentiate functions and behaviours of individuals in group processes. Benne and Sheats (1948, 2000) pointed out that the leader was a fundamental role in a group, but other roles should not be neglected. They said,

> "Efforts to improve group functioning through training have traditionally emphasized the training of group leadership. ... Little direct attention seems to have been given to the training of group members in the membership roles required for effective group growth and production."
>
> (Benne and Sheats, 1948, p.41; 2000, p.347)

In Benne and Sheats' (1948, 2000) view, identification and analysis of members' roles enacted in group processes was important as it was related to group growth and development. The role typology developed by them has become a classic reference and is widely used as a framework for studying group processes and group dynamics. The role types in the Benne and Sheats' (1848, 2000) typology are comprehensive and detailed. They had been used as the framework for describing and analyzing role interdependence in the project groups of this study. However, the original role categories had been re-grouped to serve the research purpose. Table 2.1 shows how Benne and Sheats' role types were re-grouped for use in this study.

Table 2.1 : Role categories re-grouped from Benne and Sheats' typology for use in this study

	From Benne and Sheats' role typology		Roles re- grouped for this study
	Roles	**Role descriptions[5]**	
Task roles	Coordinator	Shows the relevance of each idea and its relationship to the overall problem.	**Leader** *(Coordinating information and orienting members into the right discussion direction are the salient functions of a " Leader")*
	Orienter	Refocuses discussion on the topic whenever necessary.	
	Initiator/ Contributor	Recommends novel ideas about the problem at hand, new ways to approach to the problem, or possible solutions not yet considered.	**Initiator** *(The term "Initiator" is adequate to describe a member who is full of initiatives and actively in contributing and appraising ideas in group discussion)*
	Evaluator/ Critic	Appraises the quality of the groups' methods, logic and results.	
	Elaborator	Gives additional information, examples, rephrasing, implications about points made by others.	**Elaborator** *(The term "Elaborator" has covered the functions of making elaborations on others' ideas by giving and seeking information from the others)*
	Information giver	Provides opinions, values and feelings	
	Information seeker	Emphasizes getting the facts by calling for background information from others.	
Relational roles	Harmonizer	Mediates conflicts among group members	**Harmonizer**
	Follower	Accepts the ideas offered by others and serves as an audience for the group	**Follower** *(The term "Follower" has adequately described the role of a member who tend to follow and compromise with the views of the other members)*
	Compromiser	Shifts his or her own position on an issue in order to reduce conflict in the group	

[5] The descriptions are adapted from Forsyth, D.R. (2010). *Group Dynamics (5th ed.)*, p.151.

In Benne and Sheats' (1948, 2000) typology, group roles are divided into "*task roles*" and "*relational roles*". *Task role* refers to the position occupied by a member who performs behaviors that promote completion of tasks and activities, including initiating structure, providing task-related feedback, setting goals and so on (Forsyth, 2010, p.150). It focuses on the group's goals and on the members' attempts to support one another as they work. *Relational role* refers to the position in a group occupied by a member who performs behaviors that improve the nature and quality of interpersonal relations among members, including showing concern for the feelings of others, reducing conflicts, enhancing feelings of satisfaction and trust in the group, and so on (ibid). Leader (or coordinator, orienter), Initiator (or contributor, evaluator, critic), and Elaborator (or information giver, information seeker) are task roles; while Harmonizer (or compromiser) and Follower are relational roles.

Benne and Sheats' (1948, 2000) role typology has become a major referencing framework for analyzing role expectation and role structure. Their differentiation between "Task roles" and "Relational roles" has inspired me on making correlation to role types and group norms, which will be discussed in Chapter 4.

2.3.2 Group norms

Differentiated roles and integrating norms are the two important aspects for understanding collaborative processes. Roles are to differentiate responsibilities, functions and obligations of group members, while norms are to integrate efforts and actions of all group members into a unified whole (Johnson and Johnson, 2009). Roles are expectations governing the appropriate behavior of an occupant of a position, and norms describe the kinds of behavior that members usually perform, and define what most members would do, feel or think. Roles and group norms are interrelated.

Norms are not imposed, but develop from interactions among group members. Norms are the emergent and consensual standards that regulate group members' behaviors (Forsyth, 2010). A group's norms are implicit standards that members take for granted and comply

with them automatically (Aarts, Dijksterhuis, & Custers, 2003). Group norms are a manifestation of cultures, characteristics and attitude of a group. Group norms are essential for a group to be cohesive and united in efforts to pursue a common goal (Forsyth, 2010). Members' involvement is a phenomenon reflecting group norm. Members with high degree of involvement may indicate that there is cohesiveness and unity, and possibly lead to more desirable group norms.

2.3.3 Group conflicts

Conflict management, another element of Social Interdependence Theory, is one of the important aspects in studying collaborative group processes. Empirical findings indicate that process of articulation, conflict, confrontation, and co-construction is beneficial to learning, because it may provoke students to reflect on their conceptions (Dreyfus et al., 1990; Chinn & Brewer, 1993; Limon & Carretero, 1997; Chan, 2001).

Conflict is a natural consequence of joining a group. Conflict is defined as the interaction of inter-dependent people who perceive incompatible goals and interference from one another in achieving those goals (Hocker and Wilmot, 1998). This interdependence leads to conflict when members' ideas, goals, motivations and interests clash. Conflict is an unavoidable part of group relations. Too little conflict can be as bad for a group as too much conflict (Disanza and Legge, 2003).

Sources of conflict may come from differences in goal, personality, procedures or miscommunication. There are *substantive conflicts, procedural conflicts, and personal conflicts* (Forsyth, 2010). *Substantive conflicts* are disagreements about issues relevant to the group's real goals and outcomes. They occur when ideas, opinions, interpretations and values clash. *Procedural conflicts* occur when strategies, policies and methods clash. They are caused by procedural ambiguities which can be minimized by setting up rules and procedure statements that specify goals, decisional processes, responsibilities, and to regulate discussions (Houle, 1989). *Personal conflicts* stem from personal disagreements and power struggle. They are rooted in members' antipathies for the others in the group.

Personal conflicts are very often without specific reference to important task issues.

According to Ruble and Thomas (1976), group conflicts can be resolved by five styles (c.f. Table 2.2):

Table 2.2: Ways of resolving conflicts (*adapted from Ruble and Thomas, 1976*)

Competitive style	Striving to maximize own outcomes by debating, arguing, or threatening. Toughness and abrasiveness are the common tactics in the competitive conflict styles. It may appear to be negative, but it is useful when the issue is important, time is short, and members do not have mutual trust of the other disputing party.
Avoidance style	Avoiders are apathetic and refuse to engage in conflicts. Inaction, withdrawal, "wait and see", denial, and evasion are the common ways in avoiding conflicts. It is useful if preserving the relationship is more important than the issue.
Accommodating style	The accommodating person will engage in conflict but quickly cave in to the demand of the other people. Accepting, smoothing, giving in and yielding are the common behaviors in the accommodating style. It is useful in preserving relationship, and if the other disputing party is in power.
Compromising style	Both parties are willing to give in on some demands in return for concessions from the other. The compromising style is typical of having back and forth negotiations and with some yielding from both parties in achieving joint outcomes.
Problem solving style	Members work to create solutions that meet the important interests of the group. Strong signs of collaborating and sharing and high concern both for self and for others are exhibited in the problem solving style. It helps to meet the needs of both parties, and it attains at a win-win situation.

Forsyth's (2010) categorizing source of conflicts, and Ruble and Thomas's (1976) ways of resolving conflicts had concurringly led to a more thorough understanding of the nature of group conflicts. They are also adopted as the framework for describing and analyzing conflicting situations occurring in the project groups of this study. Detailed discussions will be provided in Chapter 6 "Conflict Management".

2.3.4 Group development

All groups change over time. Analysis on group development provides a lens to see how a group evolves into maturity, and what kind of group experience members have encountered. There are different theories on modeling stages of group development. For example, Tuckman (1965, 1977) modeled group development into five stages: (i) the forming stage; (ii) storming stage; (iii) norming stage; (iv) performing stage; (v) adjourning stage. Wheelan (2004) proposed that a group will go through five phases before it gets to mature: (i) dependency and inclusion; (ii) counter-dependency and fight; (iii) trust and structure; (iv) work; (v) termination.

Isaacs (1993) studied the relationship between group development and discourse patterns. He found that dialogues in the collaborative learning groups usually went through 4 phases, which were associated with different discourse patterns (c.f. Table 2.3).

Table 2.3 : Group development and discourse patterns in collaborative discussions *(based on findings by Isaacs, 1993)*

Phase	Group development stage	Associated discourse Patterns
1	Conflict and defensiveness are the norm	Discourse of cognitive conflict and discrepancies
2	Group members begin to explore the underlying pattern of thought that supports and feeds the different views	Discourse of elaborative explanation
3	Members begin a process of inquiry in which thinking, speaking and respect for the facts and opinions of others take on new meaning	Discourse of collaborative inquiry and questioning
4	Group members create different levels of thought and meaning	Discourse of problem solving, decision making, and co-construction of shared meanings

With reference to the work of Tuckman (1965, 1977), Wheelan (2004), and Isaacs (1993), a 3-stage model is developed for analyzing students' perceptions of their group experience in this study. The three stages are:

(i) the project planning and formulation stage;

(ii) the project execution stage;

(iii) the project concluding stage.

Students' perception and experiences in different project stages will be summarized and discussed in Chapter 7 "Students' Perceptions of Group Experience".

2.4 Studies on Cognitive Reasoning

Peer interaction and group processes (role interdependence, group norms, leadership, group conflicts, and group development) contribute to one of the two major areas of my study. The other area is on students' cognitive reasoning manifested in group discussions. This part is to analyze the happenings in collaborative group discussions by using conversational analysis, focusing on several discourse types including exploratory questioning, elaborative explanation, argumentation, and problem solving.

2.4.1 Collaborative discussion and conversational analysis

Collaborative learning is a social process in which students move from assimilation to construction, and create new understandings based on the discussions they have had (Puntambekar, 2006). Collaborative discussion is an effective tool for promoting deep learning and higher-order learning (Visschers-Pleijers et al., 2006). Verbal interactions in group discussions, such as questioning, explanation, elaboration, argumentation, are considered as cognitive process (Chinn et al., 2000; King et al., 1998; Webb et al., 1994), learning-orientated interactions (Visschers-Pleijers et al., 2006), and productive modes of talk (Mercer, 1996).

There are three aspects of interaction contributing to learning being identified in collaborative discussions (Sawyer and Berson, 2004):

1. Members providing and receiving explanations;
2. Members mediating role played by conflict and controversy;
3. Members building on each other's ideas to jointly construct a new understanding.

Group learning is a way of encouraging the development of high-level cognitive reasoning for students (Thorley & Gregory, 1994). Considerable research interest has been given to the co-construction of new understanding brought about by cognitive reasoning in collaborative learning groups. Research findings demonstrate that collaborative discourse results in the emergence of new insights (Cobb et al., 1997; Sawyer, 2001, 2003) and high order thinking (Cohen, 1994).

Collaborative learning takes place in the form of social interaction, which mediates between the group and individual learning. The discourse moving in group discussions is "a kind of collaborative constructive activity" (Chan, 2001, p.445), in which information is processed and interpreted among members in the group. Some researchers found that successful learning groups tended to engage in interpretative talks, collaborative enquiries, and co-construction of explanations among group members (Teasley, 1997; Coleman, 1998; Kuhn et al., 1997; Okada & Simon, 1997).

Collaboration interactions are in the form of conversational phenomena and dialogues. Knowledge is collective and external, when manifested in conversation, then it becomes internalized. Learning to think together means learning to dialogue because of the following reasons (Isaacs, 1999):

(i) Dialogues can produce "an environment where people are consciously participating in the creation of shared meaning" (Isaacs, 1993, p.26).

(ii) "Dialogue is a powerful communications practice that transforms those who engage in it" (Ellinor and Gerard, 1998, p.3).

(iii) "Dialogue as a means of achieving parity in collaboration while facilitating mutual reflection, growth, and change" (Clark et al., 1996, p.228).

(iv) Dialogue is the principal mode of discourse that learners use to construct new meaning (Peters & Armstrong, 1998).

There has been a general shift of interest to investigating collaborative interactions through discourse patterns (Mercer, 1995; Okada & Simon, 1997; Coleman, 1998; Tao & Gunstone, 1999; Hogan et al., 2000). Verbal interaction is considered as the principal discourse of collaborative learning, because learning in collaborative groups depends on the cognitive levels achieved within verbal interactions. A number of studies have investigated the types of verbal interactions that are most likely to facilitate learning in collaborative groups (Cohen, 1994; Webb and Palincsar, 1996). For example, Webb (1991) reported that verbal interactions in the form of elaborated explanations facilitate learning for group members who give explanations. Chan's (2001) analyses of collaborative interactions discovered two contrasting discourse patterns: successful learners were more often engaged in problem-centred discourse; and unsuccessful learners employed more surface discourse moves.

Sawyer and Berson (2004) had used conversational analytic methods to study the discourse processes of collaborative peer groups by finding out the features of conversation that were associated with effective collaboration. They pointed out that there was a neglect of conversational data in researching collaborating learning:

> "Several decades of research into cooperative groups has proven that peer groups contribute to learning. However, unlike more recent sociocultural approaches, this tradition has not examined the conversational dynamics of these groups; studies of cooperative learning primarily focus on individual outcomes, task structures, and incentive structure."
>
> (Sawer and Berson, 2004, p.405)

In analyzing four tutorial group discussion sessions of an undergraduate programme,

Visschers-Pleijers et al. (2006) found that in tutorial discussions 80% of the verbal interactions were learning-oriented. Among them, 63% were on cumulative reasoning, 10% were on exploratory questioning, and 7% were on handling conflicts about knowledge. Soter er al. (2008) made an "analysis of discourse" (Soter et al. 2008, p.373) to examine 36 discussion transcripts, and suggested that "authentic questions, uptake, the density of reasoning words, and elaborated explanations may indeed be useful measures of productive discussions" (ibid).

Jeong (2006) analyzed student groups' online debates and confirmed that conversational language could help to produce patterns of interaction that fostered high levels of critical discourse, and some forms of conversational language were more effective in eliciting responses than others. Similarly, Puntambekar (2006) analyzed collaborative interactions occurring in an online course to see how ideas converged, and how knowledge and richer understanding were built.

Conversational analysis and discourse pattern analysis are used for studying collaborative group learning in a number of studies, and they have yielded insights on how group dynamics and members' interactions take place in small group. The literature has given the understanding that learning occurs in the process of human interaction, and conversation is the primary mechanism through which students deepen their understanding in collaborative interactions. By discussing, elaborating, and disputing ideas, students create new conceptual nodes and linkages that they are able to appropriate and apply (Barron, 2000; Bruffee, 1999; Cohen, 1994; Fall et al., 2000; Roschelle, 1996; Webb et al., 1995).

As various studies show, in collaborative discussions, students are engaged with high-level cognitive reasoning, in which exploratory questioning, elaborating explanation, cumulative reasoning, collaborative argumentation and conflicts are manifested. The outcome is problem-solving and decision making, resulting in the co-construction of shared meaning. This concept forms the basis for the analysis of group processes in Chapter 5: "Cognitive Reasoning in Group Discussions".

2.4.2 Exploratory questioning

Exploratory questioning refers to the higher-order questions which can trigger members to check each other's information and to provide explanations and justifications (Webb, 1995). They can be in the form of open questions which elicit new information and elaborative explanations. They can also be in the form of critical questions which check and verify other members' ideas (Visschers-Pleijers et al, 2006). Responses generated by exploratory questions are regarded as high-level thinking in terms of students' reasoning processes (Nystrand et al, 1997).

King (1991) found that students who could use strategic questions outperformed the others in problem-solving learning activities. King et al. (1998) also found that asking thought-provoking questions helped to promote the development of high-level discourse and complex knowledge construction.

2.4.3 Elaborative explanation

Elaborative explanations are elaborated descriptions of how things work, why some things are the way they are, and how they should be thought about (Webb, 1991). A series of studies by Webb and his team indicated that giving elaborative explanations is beneficial to student learning. Explanation is found to be linked to achievement (Webb, 1992), and it can foster "cognitive restructuring and cognitive rehearsal on the part of the student doing the explaining" (Webb et al., 2002, p.13). Webb et al. (2008) found that there was a strong predicator of engagement in higher order learning for students who gave explanations rather than just receiving them. Explanations are an important part of collaborative discourse, for they enhance the linking of solutions to variables operating in problems, connecting prior knowledge to new information, and placing knowledge into practice (Chizhik, 1998).

Elaborative explanation is associated with cumulative reasoning. They both operate on each other's ideas. In cumulative reasoning, members build positively on the idea of one

another, so that a common knowledge is constructed by accumulation. Cumulative reasoning promotes cognitive advances as members have the opportunity to integrate ideas and construct new knowledge in discussions (Kruger 1992). In elaborative explanatory discourse, students can rectify misconceptions and consider different viewpoints. They demonstrate the ability of "generating connections among ideas and between ideas and prior knowledge" (Nussbaum, 2008, p.349). Explorative explanation and cumulative reasoning often involve automatic consensus, judgment acceptance and confirmation, thus the level of knowledge processing is not as deep as in the case of cognitive argumentations (Visschers-Pleijers et al., 2006).

Elaborated explanations are found to be linked to achievement, in which peer discourse provides speakers with an opportunity to integrate ideas with speaking, and listeners receive new information that helps them construct new knowledge. A number of research studies tend to indicate that high-order reasoning is manifested in peer discussions, and promotes cognitive advances (King et al., 1998; Webb & Farivar, 1994, Kruger, 1992). As students interact together, they have to justify and explain their positions and ideas; they have to organize their understandings so that their explanations can be easily understood. In so doing, they will possibly construct new understandings, knowledge and skills, and at the same time develop positive impacts on their own learning and performance (Wittrock, 1990; King 1999).

2.4.4 Cognitive argumentation and conflicts

Cognitive argumentation is the direct force in driving critical inquiry among members. It is the process where "meaning is re-negotiated and re-constructed" (Jeong, 2006, p.371). Cognitive argumentation involves presenting evidence to support position and providing reasons to convince others to accept the position. Argumentation is recognized as a tool for fostering reflection and deep thinking (Veerman et al., 2002; Andriessen et al., 1999). In exhibiting cognitive argumentation, members will challenge one another's ideas by using counterarguments, reasons and evidence. They work together to construct and critique arguments (Golanics & Nussbaum, 2008), presenting disagreement, producing

contradictory utterances and judgment negation. These are considered as constructive conflicts which stimulate learning process (Chinn et al., 2000).

Cognitive conflict may elicit transactive dialogues, where members build on each other's ideas to reach a mutually agreed solution to the task problem (Azmitia & Montgomery, 1993). Argumentation is critical discourse in which "participants assume different points of view and use arguments, counterarguments, and refutations to resolve their conflicting opinions" (Nussbaum, 2008, p.349). People with this perspective believe that cognitive argumentation and conflicts can achieve deeper level of knowledge processing (Visschers-Pleijers et al., 2006).

To arrive at a shared conclusion or solution, collaborative argumentation is a necessary process. Chinn and Anderson (1998) had shown that lengthy discussions could be characterized as complex webs of positions, supporting reasons and evidence, and counterarguments against those reasons and evidence. Chinn et al. (2000) further supported that more complex argumentation promoted learning particularly when the arguments were collaboratively constructed. The literature show that argumentation is an important aspect of achieving cognitive reasoning in collaborative discussions because it fosters reflection and deep thinking (Andriessen & Coirier, 1999), and allows for the process of negotiation (Petraglia, 1997).

2.4.5 Problem solving, decision making and co-construction of shared meaning

Problem solving and decision making result in co-construction of ideas, which may unlikely be achieved without social interaction (Roschelle, 1996; Vygotsky, 1962). When students interact with other members in a group, something collective is produced (Wertsch, 1991). The essence of collaboration, it can be argued, is the construction of shared meanings, through which divergent ideas and perspectives are built into collaborative knowledge. When students interact with other members in a group, something collective is produced (ibid). When students share their thinking as they work

together, new understandings will be created (Schwartz, 1999; Chan et al., 1997; Roschelle, 1992; Brown and Palincsar, 1989). In co-constructing shared meanings, the group has to go through the stage of problem-solving and decision making.

The purpose of decision making is to decide on action toward goals that group members wish to achieve. For effective problem solving, members have to obtain information they need, and then put the information together in such a way that results in an accurate and creative solution (Johnson and Johnson, 2009). Effective decision making and problem solving in collaborative groups requires communication that: (i) promotes sound reasoning and critical thinking (Gouran and Hirokawa, 1996); and (ii) fully utilizes the resources of group members (Johnson and Johnson, 2009).

In co-constructing shared meanings, the group has to go through stages of problem-solving and decision making. Several group process studies argued that the key to improve group decision-making is to explain, justify, understand, and bring conflicts to attention (Lemus et al., 2004; Baker, 1999). The condition for arriving at shared meanings is the distributed thinking being resolved by members working on the same aspect of the problem and sharing the cognitive responsibility for the task. When students share their thinking as they work together, new understandings will possibly be created (Brown and Palincsar, 1989; Roschelle, 1992; Chan et al., 1997; Schwartz, 1999).

2.5 Discussions of the Literature

2.5.1 Collaborative learning in higher education

The literature tends to suggest that the higher education sector embraces collaborative learning methods as a way to foster students' communication, leadership, problem solving, and self-esteem. These learning outcomes are said to help university and college graduates meet the demands and rigors of the workplace (McNally, 1994). The outcomes of collaborative learning, potentially include high-level reasoning, creative problem solving ability, positive interpersonal relationships, psychological health and self-esteem, inculcation of desired attitudes, and love of learning and civic values, are commended as

having "multiple and far reaching impact on students' college experience" (Johnson & Johnson, 2007, p.19). Other research findings also echoed that group learning helps the development of communication, presentation, problem-solving, leadership, delegation and organization for university students (Cheng and Warren, 2000).

It is noticed from the literature that, most studies on collaborative group learning in higher education are associated with structured learning activities, such as classroom-based, (e.g. Johnson et al., 2000; Phipps et al., 2001) web-based (e.g. Oliver and Omari, 2001), collaborative groups in distance learning (e.g. Brewer and Klein, 2006), collaborative dialogues in chat rooms, discussion boards (e.g. Eastman & Swift, 2002; Bobbitt et al. 2000; Gremler, et al., 2000), internet communication and electronic mediation (Reeves, 1996; Tullar et al., 1998; Kaiser et al., 2000), and tutor's role in enhancing group collaboration (Colbeck et al., 2000; Sawer and Berson, 2004).

These studies focused more on structured, classroom-based, one-off, and teacher-guided collaborative learning experience. It seems that the dynamics, attitudes, and experiences of long term, self-managed, and face-to-face groups are less understood. The other limitation of research on group work is having too much focus on short-term demonstrations of behaviour change, but with a few direct observations of students' face-to-face interactions (Summers and Volet, 2010).

Studies on collaborative learning in the context of Hong Kong higher education are scarce. A few Hong Kong based studies are related to computer assisted learning activities (e.g. van Aalst et al., 2007; Tait, et al., 2003; Beatty, 2002), and using web technology to teach large class of students in the online and distance environment (e.g. Auyeung, 2004). These studies are targeting at sciences or social sciences students, and they are not looking at the face-to-face kind of learning context.

Zhu et al. (2009) launched a study on how the Beijing university students perceived a collaborative e-learning environment and to find out the factors affecting their online performance and academic achievement. While the majority of the literature reviewed

emanates from the western world and not Hong Kong, the study of Zhu et al. (2009), though with different research aims, different methodology, and different subject targets, does offer a more specifically Chinese cultural perspective that can be utilized in my study. It is an unusual piece of research as it touches on the cultural typicality of Chinese students, such as: is e-learning more preferred (Chin et al., 2000); is e-learning as successful as conventional classroom learning (Cheung and Kan, 2002); is silence and passiveness of the Chinese students hindering discussion in e-learning collaboration (Wang, 2006), and so on. Such cultural dimensions offer an alternative angle to the western literature on collaborative learning.

2.5.2 Major aspects of collaborative learning

The research literature has given rise to a well defined understanding on the major aspects of collaborative learning. The Social Interdependence Theory developed by Johnson and Johnson (2003a, 2006, 2009) has provided a comprehensive framework covering the major aspects and group dynamics regarding collaborative learning. Role interdependence, as found from the literature, is one important aspect of collaborative learning. The role typology developed by Benne and Sheat (1948, 2000) is being used as a classic reference for studying role structure and interdependence in collaborative learning groups.

There are also discussions in the literature on conflicts occurring in student learning groups. Literature shows that conflict and confrontation is an unavoidable part of group relations. They come from different sources and can be resolved by different styles. Ruble and Thomas (1976) have proposed five resolving styles, which are adequately comprehensive to understand and describe the conflicting situations occurring in groups.

The body of literature has also given rise to an extensive understanding on collaborative discourse related to exploratory questioning, elaborative explanation cognitive argumentation, problem solving and decision making, which all contribute to the attainment of shared understandings.

2.5.3 Methodological insights

As seen, there is a growing body of research applying triangulation procedures to integrate results from different data sources, such as combining discourse analysis with coding and process analysis (Strijbos & Fischer, 2007). There has been more attention given to the analysis of verbal interactions taking place in collaborative group discussions. The conversational analysis approach yields much deeper understanding of peer discourse in mediating learning. It is seen in the literature that until the late 1990s, there were few studies examining how collaborative group phenomena emerge from extended sequences of discourse with the turn-by-turn interaction patterns that occur among students in a group. Researchers on collaborative learning rarely used detailed transcription methodologies of conversation analysis.

In the late 1990s, the idea that conversation is responsible for the benefits of collaborative learning inspired a burst of research in how discourse contributes to learning. Recent studies have examined the discourse process of collaboration in science (Boxtel, Linden, & Kanselaar, 2000; Green & Kelly, 1997; Kelly & Crawford, 1997; Richmond & Striley, 1996), mathematics (Sfard & McClain, 2002; Chiu, 2000). In the studies of Mercer (1995), Hogan (2000), and Chan (2001), it was found that collaboration was related to discourse pattern. Productive discourse helps enhancing group learning. The value of Chan's (2001) study was to confirm the discourse patterns and discourse moves as essential for having more in-depth understanding of collaborative process.

2.5.4 Impact on the study

The strengths of the past studies, especially the works by Johnson and Johnson, offer insights for constructing the framework for this study. The notion of positive interdependence and high-level cognitive reasoning will converge to form a unified and coherent study on collaborative learning process of the college students in Hong Kong. The conversational analysis approach will be adopted to examine the discourse patterns

manifested in the discussion sessions of the students.

The literature has also revealed some limitations of the past studies, that many of them are in-class, short-term, targeting at non-arts students, with the imposition of predisposed frameworks and teacher guidance, and do not examine genuine collaborative dialogues. Another weakness is in their potential lack of applicability to the Hong Kong local context. The study I am doing now will hopefully fill a gap in the literature by providing an understanding of collaborative learning in the following areas:

- It is in the local context of Hong Kong higher education;
- It targets students of the arts discipline;
- It examines face-to-face collaboration rather than in an on-line learning environment;
- It examines genuine dialogues and verbal interactions in the collaborative groups rather than computer-mediated communication.
- It examines the long term group learning processes rather than that of the one-off or ad-hoc group experience;
- It focuses on out-of-class learning activities that are non-prescribed, unstructured, self-managed, and without tutor-supervision;
- It looks at collaborative learning experience in small groups rather than in big classes.

Chapter 3 : Methodology

3.1 Research Approach and Perspectives

As this study is aiming at obtaining an in-depth understanding of the collaborative processes and experiences taking place in student learning groups, the most appropriate research approach is a qualitative study with the phenomenological perspective and using the case study approach.

3.1.1 A qualitative study

This is intended to be a qualitative study as it aims to understand and describe the collaborative processes and experiences that college students engage in the project group learning. Analysis is conducted to "explore issues in depth and from the perspectives of different participants, with concepts, meanings and explanations developed inductively from the data" (Ritchie and Lewis, 2003, p.267) regarding the role of interdependence, cognitive reasoning, conflict management, and students' perception of the group experience. The analysis is hopefully leading to a solid description and interpretation of what is actually taking place in the collaborative process of the student learning groups.

As Punch (1998) said,

> "Quantitative questions require quantitative methods to answer them, and qualitative questions require qualitative methods to answer them."
> (Punch, 1998, p.19)

This study is concerned with accessing the participants' voices as directly as possible by collection of data about their experiences and perceptions (Patton, 2002; Bowden & Green, 2010). Hence three types of data sets were used for analysis: (i) the taped group discussion sessions; (ii) individual student interviews; and (iii) students' personal written reflections. These qualitative data sets were triangulated to understand the collaborative

process by: [6]

- analyzing the words of students (in discussions, interviews, and reflective writings) rather than numbers;
- obtaining naturally occurring data (discussions, interviews and reflective writings) rather than experiment and rigidly structured interviews;
- understanding meanings through documenting the world from the point of view of students (in interviews and reflective writings).

The qualitative nature of this study involves reporting multiple perspectives, identifying factors, and sketching in the larger picture that emerges (Creswell, 2007). The data analysis will lead to the representation of three kinds of voice: individual voice, collective voice and researcher-interpreted voice (Boden & Green 2010). It keeps a focus on understanding the meaning that the participants hold about the group processes, and also allows for the researcher to make interpretations of what is heard and understood (Creswell, 2007). The qualitative analysis of this study will contribute to four aspects (Ritchie and Lewis, 2003, p.27):

(1) Contextual – to describe the form and structure of collaborative process taking place in the college student learning groups;
(2) Explanatory – to interpret and give meanings to the collaborative process;
(3) Evaluative – to appraise effectiveness and good practices of what happens in the collaborative learning process;
(4) Generative – to aid the development of strategies for teachers to manage student project groups.

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[6] Hammersley (1992, p.160-172) and Silverman (2001, p.38) suggested that qualitative research had "Three Preferences": preference for qualitative data; preference for naturally occurring data; and preference for meaning. These preferences had mapped exactly what this study was targeting at.

3.1.2 The phenomenological perspective

"The phenomenon in phenomenology is the direct, lived experience of the human being" (Stablein, 2009, p.2). The gist of phenomenological approach is the search for meaning and understanding the problems of human existence (Ehrich, 2003). As this study is aiming at understanding and describing the real experience of students in collaborative learning groups, it has adopted the phenomenological approach in its broadest sense.

This study adopts the phenomenological approach because it intends to explore and describe "phenomenon" of collaborative group process as it presents in the lived world in which students experience it (Husserl, 1970; Ehrich, 2003; Grace and Ajjawi, 2010). The phenomenological approach also helps to obtain in-depth understanding, collect deeper perceptions, and give meanings to the phenomenon on group processes, experiences, and relationships (Plumer, 1983).

The phenomenological approach allows for phenomenon to emerge without imposition and presuppositions. It requires the researcher to handle the research process with an attitude of openness, and to be involved in a process of critical self-awareness and reflexivity on shifting back and forth from personal assumptions to looking at participants' experiences (Finlay, 2009).

The phenomenological approach has led this study to an open and exploratory manner in allowing themes and propositions to emerge from students' talk (from interviews, reflective writings, and discussion sessions). Significant statements, sentences, or quotes that provide an understanding of how the participants experienced the phenomenon are highlighted for developing into clusters of meaning (Creswell, 2007). It allows the collaborative group process to be described rather than explained, and the information to be represented from the perspective of the research participants as far as possible.

The premise of the phenomenological approach is that experiences of individuals are a valid source of knowledge (Finlay, 2009), and to understand people's experience as

directly as possible (Patton, 2002). There are a variety of ways associated with data collection for the phenomenological approach, such as protocol writing, interview and observation (Van Manen, 1997, 2007). In this study, for example, interviews are conducted in an unstructured way so to allow students to talk at some length about their collaborative experience, including thoughts, perceptions and feelings.

3.1.3 The case study approach

As defined, case study "connotes a spatially delimited phenomenon observed at a single at time or over some period of time. It comprises the phenomenon that an inference attempts to explain. … In a case study, the sample is small, by definition, consisting of the single case or handful of cases that the researcher has under her lens. … The sample of cases rests within a population of cases to which a given proposition refers" (Gerring, 2007, p.19-22).

This study intends to do an intensive study of a small number of cases for the understanding of a large class of similar cases. The virtue of using case study approach is the depth of analysis, richness of description, details of phenomenon, and variance of behaviours that it can offer.

Which cases to be chosen is an important issue for the case study approach. As this study does not intend to use quantitative analysis in generalizing statistical results, random sampling is not adopted as the way to select cases. Gerring (2007, p.89) has suggested several ways of case selection, such as: *Typical, Diverse, Extreme, Deviant, Influential, Crucial,* and so on. In my study, I selected the participating groups by using the *Typical* and *Diverse* ways.

For *Typical,* it means that the selected groups are typical and representational of the college student population who are engaged with the kind of collaborative group experience. For *Diverse*, it means that the selected groups also illuminate a range of variation on the group process which is brought about by different group composition.

Typicality has the potential to provide insight for the broader phenomenon of collaborative process; while diversity may offer perspectives on the possible variables occurring in group processes.

3.1.4 The research aims revisited

This qualitative study with the phenomenological perspective and case study approach is to answer three questions (also stated in Chapter 1):

1. **Does role structure impact on the collaborative process of the student project groups?**
   It is to understand the role structure in the project groups, and to see to what extent that role composition will affect group norms, communication patterns and behaviour level of members in the project groups.

2. **Does high-level cognitive reasoning occur in the student project group discussions, and in what discourse forms?**
   It is to explore whether members are engaged in high-level cognitive reasoning, and what kinds of discourse forms are used in the discussion dialogues.

3. **How are conflicts managed in student project groups, and what is the perception of individual members on their group experience?**
   It is to examine the nature of conflicts and the ways of resolving them in the project groups. It is also to see the kind of perception that students have on their group experience and collaborative process.

3.2 Data Collection Method

3.2.1 Triangulation of data

Students' experience in collaborative group learning was investigated from several dimensions through different sources and by multiple methods, aiming at constructing an in-depth and holistic understanding of the phenomena. Data were collected from three sources:

(i) Tape-recordings of three discussion sessions of each project group;
(ii) Individual interviews of group members;
(iii) Students' personal retrospective reflections (a 800 word piece of writing).

The taped discussions inhabited the "lived border between reality and representation" (Gubrium and Holstein, 1997:102) in providing the genuine contextual knowledge of the "*what*" and "*how*" of collaborative discussions. The interview and personal reflections provided access to understand how collaborative learners made meanings from the collaborative process, and the kind of experiences, emotions and feelings of members who had gone through the collaborative learning process.

Making use of three types of data source was to provide multi-angles for understanding the collaborative process so that the credibility of the findings could be enhanced through the triangulating of data. As Patton (2002) pointed out,

> "It is in data analysis that the strategy of triangulation really pays off, not only in providing diverse ways of looking at the same phenomenon but in adding to credibility by strengthening confidence in whatever conclusions are drawn."
> (Patton, 2002, p.556)

The credibility of a qualitative study does not just rest on the reliability of data and methods, but also the validity of the findings. Qualitative findings are "interpreted as the extent to which an account accurately represents the social phenomena to which it refers" (Hammersley, 1990, p.57). The trustworthiness of this study was based on its

triangulation of data. In searching significant features of the collaborative learning process, it brought together data from different sources and by different methods (Bassey, 1999): (i) conversational analysis; (ii) the interview protocols; (iii) documented accounts. As Silverman said,

> "By having a cumulative view of data drawn from different contexts, we may, as trigonometry, be able to triangulate the 'true' state affairs by examining where the different data intersect." (Silverman, 2010, p.133)

Three sources of data (taped discussions, interviews, and personal reflective writings) were triangulated to see whether they corroborated with one another, aiming at improving the clarity and precision of the research findings. The triangulation method is to check the integrity of inferences drawn from the data, just like setting different bearings to provide the correct position in answering the research questions (Denzin, 1978).

I do not mean to be naive to say that "the aggregation of data from different sources will unproblematically add up to produce a more complete picture" (Hammersley and Atkinson, 1983, p.199), but triangulation as a multiple analytical model helps in giving an account of structure and meaning from different dimensions, and eliminating partiality and biases that may be brought by a single context of data collection. The triangulation of data and methods is one of the "validation strategies" (Creswell, 2007, p.45). With it, the "truthfulness", "correctness" or "precision" of findings (Ritchie and Lewis, 2003, p.273) can be ensured. The account is valid in representing accurately those features of the phenomena that it is intended to describe, explain or theorize (Hammersley, 1992).

With the three data sets being triangulated through cross-comparison, inter-referencing, and corroboration, the weight of evidence should become persuasive (Creswell, 2007). The multiple data sources and methods have helped in enhancing the credibility and trustworthiness of findings in this study, and the confidence in the analytical statements was strengthened.

3.2.2 Data set 1: taped discussion

The discussion sessions of the selected project groups were taped, and the conversations were transcribed. Audio recording was used because comparing with other methods of recording qualitative data, it has the advantages of being replayed and transcripts being improved, so that "analyses can take off on a different track" (Silverman, 2001, p.162). Audio recording can also preserve the sequences of talk, which allows inspection of the dialogue sequences.

Each project group was required to tape-record three sessions of discussions, lasting for 45 minutes to 1 hour. It was stipulated that the discussion sessions had to be taped in three different stages: (i) the project planning and formulation stage; (ii) the project execution stage; (iii) the project concluding stage; allowing for a set of rich data to examine learning experiences and situations at different stages, and spanning from the project adjournment to the completion stage.

The groups were briefed and described on what exactly the three stages meant, and when getting close to these stages, they would be reminded of the recording. The descriptions of the three project stages are as follows:

(i) The project planning and formulation stage:

It is at the beginning of the project work. Group members start to plan for the project work, making editorial decisions on the direction, nature, contents, structure, story focus, writing styles of the magazine they chose. Working plans and schedules are formulated at this stage. There may be more discussions on logistical matters such as procedures, schedules, work division etc.

(ii) The project execution stage:

It is in the middle of the project work. Group members start to search for data and

information, interview people, make site visits, and write articles. Intensive discussions on the progress, quality, problems, crisis and so on, of the project work, are anticipated in this stage. There may be more elaborated explanations, concept clarifying, argumentations etc.

(iii) The project concluding stage:

It is towards the completion of the project task. Group members should have completed the writing process. Discussions on page layout, article design, and making preparation for project presentation take place at this stage. Elaborated explanation and argumentation may arise. Problem solving and decision making may also be exhibited at this stage.

3.2.3 Data set 2: Individual student interviews

Interviews are frequently used in qualitative studies with a case-study and phenomenological approach. Ritchie and Lewis (2003) pointed out that interview as a research method has the following advantage:

> "During an effective in-depth interview, participants will always be asked why they feel, act and believe as they do and these explicit accounts are of immeasurable value in understanding motivations and intentions."
> (Ritchie and Lewis, 2003, p.253)

Interview as a data collection method has offered the study depth of data, in-depth understanding of the context, deliberation of personal perspectives, and detailed coverage on the collaborative process of the student project groups. The interview method has also provided an undiluted focus on the individual in offering "an opportunity for detailed investigation of people's personal perspectives, for in-depth understanding of the personal context within which the research phenomena are located, and for very detailed subject coverage." (Ritchie and Lewis, 2003, p.36)

In this study, interviews were conducted on a one-to-one basis. Recording was taken with the students' permission. Analysis on the interview protocols was to find out students' inner state, the reasoning behind their actions, their feelings and attitude that could not be heard in the taped discussions. The interview data was coded into categories, and used for triangulation with the data drawn from the taped discussions and students' personal reflections in writing. The data triangulation helped to provide a holistic understanding of students' collaborative experience and processes when they were undertaking the project work.

The purpose of a qualitative study is not counting opinions but exploring the range of opinions and the representations of the issues (Gaskell, 2000). Thus every member in the groups was interviewed so that the range of views and experiences of students in the collaborative process could be sampled. Interviewing every member instead of a segment of members was for comparing the differing perceptions of members in the same group on how the project groups operated.

Eliciting students' perception and experience in the collaborative group process was the main purpose of interview. The interviews had provided information on how members perceived their own role and the role of other members in the group. In this case individual interviews were more appropriate than group interview, for it enhanced more in-depth sharing, allowing students to think and talk beyond the level of surface opinions. Students in such setting were found less likely to offer normative talks and opinions that might occur when the other group members were present. The individual interview could gain direct access to students' personal perception of the group experience, and allowed personal views, personal reflection and construction of the past to be explored in detail (Gaskell, 2000).

As Jones (1985) pointed out, "an interview is a complicated, shifting social process occurring between two individual human beings, which can never be exactly replicated" (p.48). The impersonal and machine-like structured interview is not suitable for this study. To facilitate a free flow of sharing and emergence of views, the interview questions were

semi-structured. Though some standardized questions were set, flexibility in conducting them was allowed.

Inspired by the work on defining semi-structured interview by Seale (1998), I had set up two guiding principles on conducting interviews:

(i) The interview was not totally unstructured. It was topic driven, covering broad questions. The guiding topics were like a check list for the interviewer to refer to when deciding what to turn to next as the interview proceeded.

(ii) The interview constructed a data matrix where all respondents had to give information on the same variables. But at the same time, the interviewer could also invent questions on the spot in order to follow up interesting responses and generate some unexpected information.

A set of topic-guided questions were set to ensure the coverage of relevant issues systematically with some uniformity, while still allowing flexibility to pursue the details that were salient to each individual interviewee. Table 3.1 has listed the guiding topics and the questions for the interview.

Table 3.1 : Questions for individual student interviews

Guiding topics	Interview questions	Purpose of question
General perception of group process	- Describe your feelings, views and observations on your project group. - How would you describe the characteristics of your project group? - Regarding the group process, do you have any unforgettable and impressive incidents to share?	-Let students warm up and be prepared to go into deeper reflections of the group experience. -allow for free deliberation of views without imposition of prior assumptions.
Group experience	What was your experience in different stages of the project work, e.g. the planning stage,	to identify students' perception of group

in different stages	the executing stage, and the concluding stage?	experience in different collaborative stages.
Role structure in the group	- Describe your role in the group? Are you happy with this role? Is this role what you expected? - Describe the roles that other members were playing. How do you feel about their roles in the group? - Whom would you consider playing the leadership role? Do you think the leader a key factor to the success of the project work in your group?	- to elicit views and feelings on students' perception of their own roles and the roles of other members. - to understand the role interdependence, level of participation and degree of cooperation in the groups.
Group conflicts and disputes	- Was the workload evenly distributed? How was the load divided? - Did any disputes or conflicts occur in your group? How often? In what ways were the disputes settled? Had the disputes affected members' cooperation?	- to identify the nature of group disputes and conflicts, and to see how students resolving them.
Concluding remarks on the group process	- Overall, what have you learnt from the project group experience? Do you find any changes in yourself after the project work, such as improvement in knowledge, ability, attitude, working style etc?	To examine the impact and effect of collaborative learning on students.

The interview questions were formulated as unthreatening, as easy to respond to as possible. They started with general and broad topics, and then went into more concrete and detailed accounts on actual occurrences of the group process. Questions related to group conflicts and disputes which might draw up unpleasant memories were purposely placed towards the end. The interview was ended by students sharing their concluding perception and comments on the group process.

According to Silverman (2001, p.87-88), there are six kinds of topics to which interview questions usually address: (i) facts; (ii) beliefs about facts; (iii) feelings and motives; (iv) standards of actions; (v) present or past behaviour; and (vi) conscious reasons. With a combination of semi-structured questions and flexibility for free articulations of views, it

is believed that the reasoning, feeling, opinion and attitudes of students on the collaborative learning experience have been fully explored.

Each interview session lasted for 15 to 20 minutes. Students appeared to be relaxed and were able to respond to the questions. The interviews were taped, transcribed and coded by themes and labels for analysis.

3.2.4 Data set 3: written retrospective personal reflections

Students were required to write a piece of 800-word personal reflection on their group project experience when the task was completed. This free-format writing allowed students to review, evaluate and conclude what they had learnt, how they felt, and what they observed on various aspects of their project work. The participating students had been informed and agreed on their writings being used as part of the data. The data provided in students' reflective writings were analyzed together with the data drawn from the taped discussions and individual interviews.

The retrospective reflective writings were coded. The themes and categories identified were aligned and compared with those captured through the interviews and taped discussions. Data generated from the personal reflections provided a point for triangulating and explaining phenomena emerging from the other two sets of data. The analysis of the personal reflective texts was a process of sifting, comparing and contrasting the different ways in which recurrent themes or key words emerged within the data. Another way to look at the reflective texts was to look for patterns of variation, which pointed to "reconcile conflicting ideas, to cope with contradiction, or to encounter alternatives" (Tonkiss, 1998:255). The texts were dealt with by the content analysis method, in which a set of categories was established and the instances that fell into each category were looked into (Silverman, 2001).

All the data gathered in this study were in Chinese. The coding and data analysis process was also based on the Chinese transcriptions. However, when writing the research report,

what students spoke about in discussions, talked about in interviews, and wrote in personal reflections, had to be translated into English. There were complexities in such back translation. No translation can be 100% matching with the original work, as there are bound to be cultural differences between two languages. The truthfulness and accuracy of the translated version of student dialogues has been preserved as far as possible. For ensuring the translation accuracy to a certain extent, a few sample texts were given to a translation expert for checking. Hence the English expressions used in this research report should not have distorted too much what student said in Chinese.

3.3 Participants and the Project Task

3.3.1 The selected project groups

As the importance of group work skills in professional life is becoming increasingly recognized, more programmes in university and colleges include group projects to develop students' ability to work as a part of a group (Bruffee, 1992). Three project groups were selected for this study. They were self managing groups, in which learning activities were aligned in a cooperative system of interdependence (Arrow et al., 2000). The learning of these self-organized task groups was goal-focused. Members were united in pursuing common goals and outcomes (Lickel et al., 2000), and they managed the group process and undertook a collaborative project task simultaneously. They were "cooperative base groups" (Johnson and Johnson, 2003, p.169; Johnson et al. 2002), which carried the following characteristics:

(i) They were long term groups working collaboratively spanning over three months. Membership was not ad hoc, but remained permanent for the entire period of collaboration. Members worked together in achieving the shared goal and striving for completing the required project task.

(ii) They were student-led groups, in which the work schedule and organization was autonomous. The conduction of group discussions was not pre-constructed. All discussion sessions took place outside class and

without teacher's presence.

(iii) Group members met regularly to discuss, execute, and hold each other responsible for attaining the project goal. They worked on an agreed group task. It was not for an individual to work on a portion of task, but the group as a whole had to develop a common goal.

3.3.2 The project task

The project was structured as part of the college curriculum, requiring students to work on a group task in their final year of study. Each project group was required to produce a 28–32 page magazine at the end of the project process. There were two stipulations on the project requirement:

(i) The magazine must have originality. Plagiarizing and copying was not allowed. All the work must come from group members.

(ii) Editorial decisions were made based on discussions by concerting members' efforts. The project groups must not simply divide the work among members so that each individual just does a portion. Members should be contributive to the accomplishment of the task.

Other than that, the groups were allowed for autonomy in the following ways:

(i) The groups were given freedom on group formation. There was no stipulation on gender, roles, familiarity level etc on membership. It was expected that each project group would be comprised of 4-5 members to ensure that the groups had a high probability of containing the necessary intellectual resources (Sweet and Michaelsen, 2007), and there was a reasonable share of load among members.

(ii) The groups were given autonomy to work on a magazine of their own choice. They could make their own editorial decisions regarding the nature, structure, contents, styles and design of the magazine. The groups established their own working procedures and schedules. Ownership of the project, from planning to implementation, rested with the groups themselves.

The purposes of incorporating the group project into the final year curriculum were:

(i) It was a summative means for students to integrate and apply what they had learnt to real-life working situations.

(ii) The group project was a channel in empowering students to become independent learners and active participants in managing their own learning, so as to enhance the decision-making and problem solving ability.

(iii) The project experience was a way to improve students' communication skills and develop their ability to work collaboratively with others as a team in achieving a common goal.

There were classroom hours designated for the project groups to meet with the teacher, who supervised the work progress and gave advice on the project work. Group discussions were managed by students and took place out-of-class without the presence of the teacher. The project process spanned over one semester (three months). The selected groups launched their projects from January to April in 2006.

3.3.3 Membership of the project groups

Three project groups were selected from an arts programme at a community college in Hong Kong. They were selected as "heterogeneous samples" (Ritchie and Lewis, 2003,

p.79), which were to ensure that the key constituencies and diversities relevant to collaborative learning were covered and explored (Ritchie and Lewis, 2003). They were typical and representative of the population of the final year project groups in the college setting in the following ways:

(i) Each group was comprised of 4-5 members, which was the nominal composition of the project group setting in the programme that they studied. The selected groups also represented different gender composition: (a) 2 boys + 2 girls (Group A); (b) all girls (Group B); (c) 4 girls + 1 boy (Group C).

Although gender factor was not an issue in this study, selecting groups heterogeneously may avoid data biases brought about by similar gender composition.

(ii) Members in the same group knew each other. There was a certain level of familiarity among them. Members did not need to spend much effort and time to make adaptation for cooperation. Familiarity among members might help to accelerate the efficiency of collaborative process, allowing members to engage into the core of discussion more quickly.

Membership of the selected groups for this study is provided in Table 3.2. All names are pseudonyms.

Table 3.2 : Membership of the selected project groups

	Project Task	Members		Characteristics
Group A *(2 girls + 2 boys)*	Working on a magazine focusing on exploring Hong Kong sub-culture	*Yuet*	Girl	-balanced gender composition -high familiarity level -quiet member: *Wan* -outspoken member: all the others - leading member: *Yuet*
		Wan	Girl	
		Ho	Boy	
		Hei	Boy	
Group B	Working on a	*Ma*	Girl	-single-gendered composition

(5 girls)	magazine targeting at pet lovers	*Suet*	Girl	-moderate familiarity level -outspoken member: *Ma, Suet* -quiet member: all the others -leading member: *Ma*
		Ying	Girl	
		Yuen	Girl	
		Yan	Girl	
Group C *(4 girls + 1 boy)*	Working on a magazine focusing on enhancing career ability for young people	*Yi*	Girl	-female-biased composition -moderate familiarity level -quiet member: *Yin* -outspoken member: all the others -leading member: *Yi, Shing*
		Suen	Girl	
		Ting	Girl	
		Yin	Girl	
		Shing	Boy	

3.4 Coding System and Data Analysis

3.4.1 Perspectives on coding

Miles and Huberman (1994) said, "information piles up geometrically", and "frameworks and research questions are the best defense against overload" (Miles and Huberman, 1994, p.55). In this study, based on the research questions and insights from the literature, provisional start lists with broad themes were first developed for coding. Smaller themes were allowed to emerge and pulled out when raw data was collected and accrual analysis was in place.

Close and repeated listening to recordings can reveal previously unnoted recurring features of the organization of talk (Atkinson and Heritage, 1984). Coding is a frequently used method in qualitative study, particularly for analyzing interviews, field notes and transcripts, in which "text numerical or alphabetic codes representing concepts, categories, or themes" will be assigned to sentences or paragraphs (LeCompte and Schensul, 1999, p.45). Miles and Huberman (1994) suggested that coding of data could be handled in this way:

> "Codes are tags and labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Codes usually are attached to 'chunks' of varying size – words, phrases, sentences, or whole paragraphs, connected or unconnected to a specific setting. They can take the form of a straightforward category label or a more complex one. … Codes are used to

> retrieve and organize the chunks ... The organizing part will entail some system for categorizing the various chunks, so the researcher can quickly find, pull out, and cluster the segments relating to a particular research question, hypothesis, construct, or theme."
>
> (Miles and Huberman, 1994, p. 56-57)

This study adopted the emergent theme analysis approach (Weber, 1990) by allowing categories to emerge from the data. The verbatim transcriptions of group discussion sessions and student interviews were sorted, labeled and coded. The "provisional start list" of labels (Miles and Huberman, 1994, p.58) deriving from the literature was created for coding the discourse patterns exhibited in the discussion dialogues, and interaction phenomena in group process as provided by students in the interviews and reflective writings. The broad themes in the start list were then reviewed and fine-grained when going into a deeper stage of analysis.

As this study took the approach of seeing data collection process as a way of "empowering and giving voice to people" rather than "treating them as objects whose behaviour is to be quantified and statistically modeled" (Bauer, Gaskell and Allum, 2000, p.12), the coding was not numerical and not based on frequency counts. The codes were in the form of broad themes initially, and then fine-grained into subcategories after repeated examination of the transcripts.[7]

3.4.2 Coding for group roles

A modified version of Benne and Sheats' (1848, 2000) role typology was used for role categorization in this study. Members were identified with a role in the group based on their own descriptions in the interviews and personal reflective writings.

Group roles were coded by five categories: *Leader, Initiator, Elaborator, Harmonizer and*

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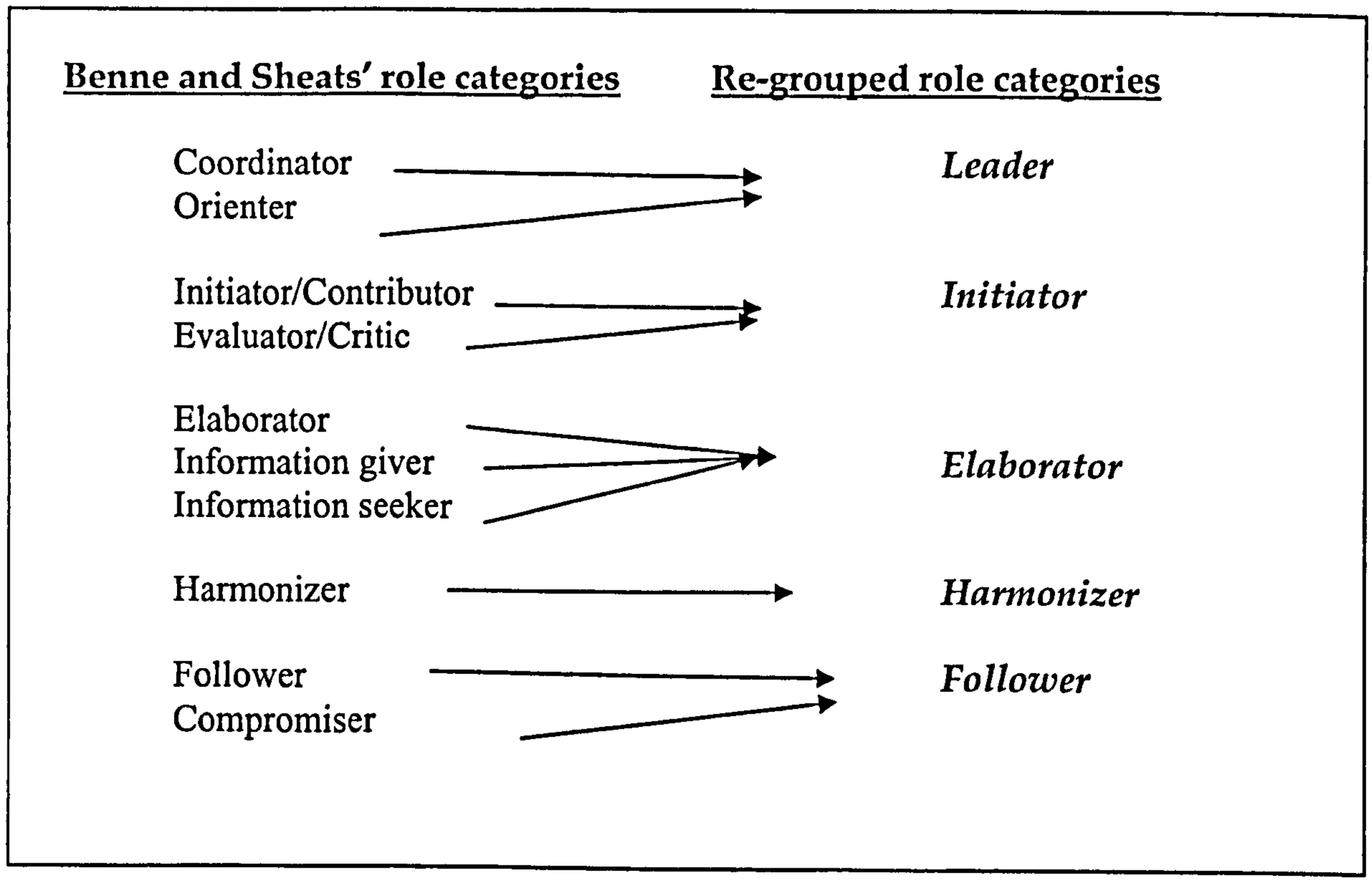
[7] The broad themes provided in the coding start list have obtained the verification by Dr. C.S. Chiu, the Director of School of Improvement Project, Hong Kong Institution of Education, Faculty of Education, The Chinese University of Hong Kong. Dr. Chiu is a scholar whose expertise in school improvement, collaborative learning, and curriculum studies and has gained high respect in Hong Kong.

Follower, which were adapted and re-grouped from Benne and Sheats' (1948, 2000) role typology.[8] Figure 3.1 shows the re-grouping of role types.

Figure 3.1: Role categories re-grouped from Benne and Sheats' model



In the interviews, students were asked to name a role and describe their functions in the group. In general they were able to identify one from the five roles. Members' roles in the group were coded against the role descriptions as listed in Table 3.3.

[8] Explanation on how the five role categories were re-grouped from Benne and Sheats' typology was provided in Chapter 2, Table 2.1.

Table 3.3: Coding system for group roles based on members' descriptions in the interview and personal reflective writings

Role Types	Role Description
Task roles	
Leader	Shows the relevance of each idea and its relationship to the overall problem. Refocuses discussion on the topic whenever necessary.
Initiator	Recommends novel ideas about the problem at hand, new ways to approach the problem, or possible solutions not yet considered. Appraises the quality of the groups' methods, logic and results.
Elaborator	Gives additional information, examples, rephrasing, implications about points made by others. Provides opinions, values and feelings. Emphasizes getting the facts by calling for background information from others.
Relationship roles	
Harmonizer	Mediates conflicts among group members.
Follower	Accepts the ideas offered by others and serves as an audience for the group. Shifts his or her own position on an issue in order to reduce conflict in the group

3.4.3 Coding for exploratory questioning

Exploratory questioning refers to the higher-order questions which can trigger members to check each other's information and to provide explanations and justifications (Webb, 1995). Veerman et al. (2002) found the Question Categorization System (QCS) developed by Greasser et al. (1994) a useful tool for analyzing the relationship between question asking and collaborative argumentation in computer-based learning. The coding system of this study did not follow the QCS, but a few categories were inspired by it. The categorizing system of exploratory questioning is provided in Table 3.4 below.

Table 3.4 : Coding system for exploratory questioning in group discussions

(Categories adapted from the QCS system are marked with asterisks)

Functions of questioning		Examples of utterance
Eliciting information	Seek confirmation or clarification	-"Do you want to arrange the page layout like this?" -"Do we all agree to place the Contents on this page?"
	Demand justifications or verifications	-"How will you compare X with Y?" -"Why don't you make use of the Photoshop to do that?"
	Infer or confirm knowledge*	-"So it means we don't need to consider the article content any more, am I right?"
Generating new ideas	Provoke thinking	-"Will a 4-page article be too heavy for the readers?" -"What other examples can we think of?"
	Stimulate creativity	-"What can you infer from this? For me I can imagine sunshine." -"Can you think of any songs that have impressed you most?"
Evaluating ideas	Evaluate other's ideas*	-"Are you saying the article will focus on analyzing grammar of the lyric?"
	Challenge other's views	-"Isn't that the article will be written by one person? You told us this last time!"

3.4.4 Coding for elaborative explanation

Elaborative explanations are elaborated descriptions of how things work, why some things are the way they are, and how they should be thought about (Webb, 1991). It enhances the linking of solutions to variables operating in problems, connecting prior knowledge to new information, and placing knowledge into practice (Chizhik, 1998). This study intended to examine how exploration explanation took place and how reasoning was accumulated in group discussions. Based on insights from the literature, elaborative explanation in group discussion was coded by the following categories (Table 3.5):

Table 3.5 : Categorizing system for elaborative explanation in group discussions

Functions of elaborative explanations		**Examples of utterance**
Statement of views	Elaborating ideas and opinions	-"The magazines we see in the market normally start on the left side. We normally read from the left too." -"Heavy articles are put in the front, lighter ones at the back – this suits the habit of reading."
	Clarifying misconceptions	-"No, I mean moving it to the page back. It will better suit our need. It makes us each have 2 pages for putting in our own article." -"No, we won't write a 'foreword', because it is not a book, but a magazine, so 'editorial notes' seems more appropriate.
Accumulation of reasoning	Adding on new ideas and perspectives	-"The editorial notes is better put at the back of the magazine." "If so, the problem of arranging page can be solved then!" -"We have to divide the whole magazine into different sections." "We can name the sections using body parts." "Yes, that will be: *eye, ear, mouth, nose*!"
	Rectifying own misconceptions	-"As you suggest, I think talking more about the local culture is better. As my article is focusing on Hong Kong, there is no reason for me to use Mainland China or overseas examples." -"OK, I agree to abandon this idea."
Generating connections	Connecting among ideas	-"We have to think about adding in an advertisement. We don't have an advertisement right now." "Yes, that is why we need to consider how to make the page design look better." -"You'd better write the personal feature first!" "Agree, writing that article first is better!"
	Connecting with prior knowledge	-"I have read the projects done by last year's students. They in fact have used only one page for writing the editorial notes." -"Teacher has mentioned that suitable spacing will make the magazine page layout look better."

3.4.5 Coding for problem solving and decision making

The essence of collaboration is construction of shared meanings, through which divergent ideas and perspectives are built into collaborative knowledge. In co-constructing shared meanings, the group has to go through the stage of problem-solving and decision making. For effective problem solving, members have to obtain information they need, and then put the information together in such a way that results in an accurate and creative solution (Johnson and Johnson, 2009).

Effective decision making and problem solving in collaborative groups requires communication that: (i) promotes sound reasoning and critical thinking (Gouran and Hirokawa, 1996); and (ii) fully utilize the resources of group members (Johnson and Johnson, 2009).

There are many ways to make decisions in group discussions, for example, decision by authority and expert member, by averaging members' opinions, and by group consensus etc (c.f. Johnson and Johnson, 2009, p.282-287). Based on these views, discussion discourse of problem solving and decision making were coded in the following ways (Table 3.6):

Table 3.6: <u>Coding system for problem solving and decision making</u>

Conditions for problem solving and decision making
Sharing information and resources
Having a focus on problem solving
Evaluating of information and alternatives
Methods of decision making
Decision by authority and expert member
Decision by averaging members' opinions
Decision by group consensus

3.4.6 Coding for group conflicts

Conflict is a natural consequence of joining a group. In this study, two aspects of group conflicts were analyzed: (i) nature of conflicts; and (ii) ways in resolving the conflicts.

Source of conflict may come from differences in goal, personality, procedures or miscommunication. There are substantive conflicts, procedural conflicts, and personal conflicts (Forsyth, 2010; Houle, 1989). In this study, nature of conflicts was categorized by the following themes (Table 3.7):

Table 3.7: Coding system for the nature of conflicts

Conflict Types	Characteristics
Substantive conflicts	Disagreements about issues relevant to the group's goals and outcomes. Occur when ideas, opinions, interpretations and values clash.
Procedural conflicts	Occur when strategies, policies and methods clash. Caused by procedural ambiguities which can be minimized by setting up rules and procedure statements that specify goals, decisional processes, responsibilities, and to regulate discussions.
Personal conflicts	Stem from personal disagreements and power struggle. Rooted in members' antipathies for the others in the group, very often without specific reference to important task issues.

There are different ways of resolving group conflicts. In this study, ways of resolving group conflicts were coded by five styles (c.f. Table 3.8, adopted from Ruble and Thomas, 1976)

Table 3.8: Coding system for resolving group conflicts

Ways of resolving	Characteristics
Competitive style	Striving to maximize own outcomes by debating, arguing, or threatening. Toughness and abrasiveness are the common tactics in the competitive conflict styles. It may appear to be negative, but it is useful when the issue is important, time is short, and members do not have mutual trust of the other disputing party.
Avoidance style	Avoiders are apathetic and refuse to engage in conflicts. Inaction, withdrawal, "wait and see", denial, and evasion are the common ways in avoiding conflicts. It is useful if preserving the relationship is more important than the issue.
Accommodating style	The accommodating person will engage in conflict but quickly cave in to the demand of the other people. Accepting, smoothing, giving in and yielding are the common behaviors in the accommodating style. It is useful in preserving relationship, and if the other disputing party is in power.
Compromising style	Both parties are willing to give in on some demands in return for concessions from the other. The compromising style is typical of having back and forth negotiations and with some yielding from both parties in achieving joint outcomes.
Problem solving style	Members work to create solutions that meet the important interests of the group. Strong signs of collaborating and sharing and high concern both for self and for others are exhibited in the problem solving style. It helps to meet the needs of both parties, and it attains at a win-win situation.

3.4.7 Coding for cognitive argumentation and conflicts

Cognitive argumentation is the direct force in driving critical inquiry among members. It is the process where "meaning is re-negotiated and re-constructed" (Jeong, 2006, p.371).

Cognitive conflict may elicit transactive dialogues, where members build on each other's ideas to reach a mutually agreed solution to the task problem (Azmitia & Montgomery, 1993). This study intended to examine aspects of argumentation and conflicts: (i) the nature of argumentation and conflicts; (ii) the resolving ways of argumentation and conflicts.

Based on the research literature, cognitive argumentation and conflicts were coded by the following categories (Table 3.9):

Table 3.9 : Categorizing system for cognitive argumentation and conflicts

Nature of argumentation		Examples of utterance
Discourse of cognitive argumentation and conflicts	Evaluate and comment	-"I don't think it is good for readers in opening the magazine and find that the editorial notes is placed in the first page." -"I feel such arrangement a bit strange."
	Disagreement and contradictory utterances	-"The editorial notes is better put at the back, because It is not as important as the other major articles." -"It does not look good this way! Having four editorial notes does not look good at all!"
	judgment negation and challenge	-"I think this view is meaningless!" -"What's the difference if we insert an advertisement here? What exactly you want to achieve with such design idea?"
Ways of resolving conflicting opinions	Proposing counterarguments and creative solution	-"Leaving this page with too much space is not good. One way to do is putting in some photos so as to fill the space." -"Allocating 8 pages for this article is too much. We can try to see whether having a bit more space will make the page layout look more comfortable to readers.
	Consider and accept	"OK!" "Alright." "That's it!" " Good!" "Correct!"
	Giving in position	-"Perhaps I can make some revisions to the personal feature article." -"I can also revise my article to make it just of one page."

	Avoid and ignore	-"OK, let's leave this issue aside and talk about other things." -"Please don't argue. Let's discuss something else."

3.4.8 Coding for group development

There are different theories on modeling stages of group development. For example, Tuckman (1965, 1977) modeled group development into five stages: (i) the forming stage; (ii) storming stage; (iii) norming stage; (iv) performing stage; (v) adjourning stage. Wheelan (2004) proposed that a group will go through five phases before it gets to mature: (i) dependency and inclusion; (ii) counter-dependency and fight; (iii) trust and structure; (iv) work; (v) termination.

Based on theories in the literature and actual operation of the project groups under study, group development were coded by the following three stages (Table 3.10):

Table 3.10: Coding system for group development

Development stage	Characteristics
Project planning and formulation	Groups to make decision on project direction, goal, structure, contents, and to set up schedules and plans for completing the task.
Project execution	Groups to do interview and site visits, writing, revising, and editing articles.
Project concluding	Groups to organize articles into a well defined magazine structure, put in design and layout.

3.5 Ethical Considerations on the Research Relationships

There were some ethical considerations that need to be considered. In this study, the teacher was also the researcher, students were participants, and the collaborative task was an assessed assignment. Caution has been taken in handling the situation with special care on the issue of "negotiating the research relationships" (Ritchie and Lewis, 2003, p.62).

3.5.1 Negotiating access

Negotiating access to the research setting before the study was considered. The researcher had explained the purposes, nature and logistics of the study to the participating groups. Groups were briefed with what they were expected to do during the investigation period. The following points were made clear to students when inviting them to participate in the study:

(i) The investigation period started when their project work took off, and ended when the project work was completed. The study would span over one semester.

(ii) The project groups had to tape their discussions which took place out-of-class without the presence of the teacher. Three sessions of taped discussion were required, one in the project formulation stage, one in the project execution stage, and one at the project completion stage. Groups could have discretion in choosing any discussion session to be taped at each stage.

(iii) The recording was expected to be kept as natural as possible. They need not edit or re-tape the discussions. Natural flow of dialogues was expected. Students were encouraged to converse among themselves as comfortably as possible by ignoring the presence of the tape recorder.

(iv) Students were informed of the need to attend a 15-20 minute individual interview to share their group experiences on completion of the project task.

(iv) Students were asked for their consent on allowing their 800-word personal reflective writing to be used as part of the data for this study.

Understanding and consent regarding the above had been obtained from the students.

3.5.2 Developing research relationship

Developing a trusting relationship between the researcher and participants was another issue that the researcher had to consider. In this study, the relationship between the researcher and participants was actually teacher and students. Thus, the potential for biases in interpreting the data based on preconceived impressions, values or expectations need to be acknowledged. As a teacher-researcher, I had been very cautious in trying to minimize my impact on data collection and analysis. The phenomenological approach of this study enabled me as the teacher-researcher to handle the research process with an attitude of openness, self-awareness and reflexivity on looking at students' experiences in an open and exploratory manner.

The advantage of the teacher-researcher was that as the teacher, I had a better understanding of the contextual issues of the study. The familiarity between me and the students may also bring the trust of students on their personal data being handled properly. Students also believed that the research findings would benefit future cohorts of students.

From a negative angle, students may feel uncomfortable of investigating by the teacher who had control over their marks. Tape recording without the teacher's presence sounded less intrusive, but might still create an "artificial" scenario as students knew that the

teacher would be listening to it. To resolve this power issue, I had provided a guarantee to students as follows:

(i) All the taped discussions would not be listened to until the project work had been assessed, and the final grades had been approved by the Examination Board.

(ii) By the same token, the personal written reflections would not be analyzed before the final grades were released. The individual interviews would be conducted after the release of the assessment results.

This gave students the assurance that what they said in the interview, wrote in the personal reflection, and conversed in group discussions, would in no way affect the teacher's impression and marking. Their performance in the study was assured to have no impact on the assessment results. They would hopefully feel more at ease in expressing themselves.

In conducting interviews, the teacher-interviewer had been very cautious in avoiding arousing negative feelings and sensitive emotions when students were making comments, providing personal reflections, and constructing previous events.

There were pros and cons in the teacher being the interviewer. The bad side was that students may feel tense and less at ease in the interview. The good side was that the teacher-investigator knew the background of the groups, and would have more empathy and understanding of students' feelings. The mutual familiarity and trust may also help students to go into deeper reflection. Furthermore, mutual understanding on the background and process of the project task could quickly help to get into the core of subject without using too many prompting questions. As the teacher-researcher, I had been very cautious of not making too many assumptions, and had allowed for free expression of students' views during the interview. The following ways had been taken to make students feel more at ease in the interview:

(i) Arranging the interview in a relaxed environment and atmosphere, to let students feel it was a sharing session more than a formal interview. Students were given the feeling that the teacher-interviewer cared for their learning rather than merely searching for answers for the study.

(ii) Adopting a flexible and open approach to allow for spontaneous and free expression of feeling and views. Questions would not be structured too tightly, and interviews were handled in a humanistic and warm manner.

There was not much difficulty in conducting the interviews. Students were informed of the purposes and question categories of the interview. Confidentiality was ensured. Students were able to provide substantial sharing on their experience in group processes as the interview was not too far from the project completion stage.

3.5.3 Ensuring confidentiality

The research relationship was also ensured by anonymity and confidentiality. The following assurances were given to the participating groups:

(i) Students were ensured that their individual identity would not be disclosed. Only pseudonyms would be used in the research report.

(ii) Personal views and reflections mentioned in the interviews would not be disclosed to anybody, including their group-mates. Students were guaranteed of the confidentiality of their views so that they could share their true feelings and honest views in the interview.

(iii) When the findings were reported, care would be taken to ensure personal quotes be handled in a way so that the identity of the person would not be easily identified.

(iv) The tape-recorded discussions and interviews would not be released to anybody and for other usage. The data derived from the analysis of conversations, interviews and personal writings would only be used for the study. The tapes and personal notes would be destroyed upon completion of the study.

By means of the above measures, sensitive issue regarding the researcher-participant relationship could hopefully be mediated to ensure fair conducting of the study.

3.6 Chapter Conclusion

With all the above methodological considerations, the rigor and trustworthiness of this study can hopefully be ensured in the following ways:

(i) The sample groups were representational. Their experiences were typical of the population, "tribe" or "subcultural group" (Silverman, 2001, p.233) that had gone through the collaborative learning experience of final year project work in the college setting of Hong Kong. The purposive sampling had secured data efficiency by providing a rationale for studying only parts of a population without losing information. The sample groups represented the population in a number of criteria.

(ii) The data of this study came from authentic accounts. Authenticity rather than reliability is often the issue in qualitative research (Silverman, 2001). The taped discussions provided access to the happenings of peer interaction and discourse patterns in the collaborative learning groups. The interviews generated data about the collaborative scenes that were not taped in the discussion episodes. Personal reflections provided another access point for inner emotion, feelings and views of the learning process. Although taping the discussions and interviews may create

some possible intrusive conditions, students reported that they had tried to show their best thinking during recording. Thus the results of this study could be interpreted as reflecting what students regarded as their most natural behavior and best attempts in discussions and interviews.

(iii) The triangulation of data was built into the methodology. The data gathered through the triangulated means were re- and cross-analyzed in order to obtain in-depth understanding of collaborative group process and of those meanings underlying it. The integrity of inferences drawn from the data was strengthened by triangulation and inter-verification of three different sources.

In sum, the "confidence indicators" as named by Gaskell and Bauer (2000, p.344), including: (a) triangulation, (b) procedural clarity, (c) purposive sampling, and (d) thick description, were present in this study.

Chapter 4 : Role Structure and Role Interdependence

To understand collaborative learning, we must understand group processes. Group processes are realized by group dynamics, which are "the influential processes that take place in groups" (Forsyth, 2010, p.1). According to Slavin (1985, 1995, 1996) and Slavin et al. (1995), the social aspect is the most salient to collaborative. The "Social Interdependence Theory" developed by Johnson and Johnson (1992, 2006, 2009) emphasizes role interdependence in the group as interdependence among members will result in the group being "a dynamic whole" (Johnson, Johnson & Smith, 2007, p.16). Students in the collaborative groups are defined as collaborative learning partners who interact and work together to advance their learning. Collaborative learning partners are said to have their relationship centred on mutual goals (Saltiel, 1998, p.6). Baldwin & Austin (1995) argue,

> "Collaboration works best when partners/team members share a common mission, have clear goals, define operating guidelines, provide mutual support, and work in an atmosphere of trust, respect, and affection"
>
> (Baldwin & Austin, 1995, p.55)

Early attention to the questions of group goals, roles, processes, and working relationships will build the adaptive capacity of a student project group. Cohen (1994) and Lewis (1997) held the view that the role and status of an individual within a group determined the individual's level of participation in collaborative groups. Analysis of individual members' role in a group is the first entry point to understand collaborative processes of the student project groups in this study.

Roles here do not refer to positional roles such as chairman, secretary and so on. Group roles refer to functional roles which emerge as a result of members' behaviours, and "are not specified in advance, but emerge from the interaction among members" (Galances and Adams, 2010, p.125). Once a role is assumed, the member is expected to behave in certain ways. Roles are defined as "a set of expectations governing the appropriate behavior of an occupant of a position toward occupants of other related positions"

(Johnson and Johnson, 2009, p.15), which contribute to the social equilibrium of the collaborative learning group processes.

This chapter will provide a discussion on role interdependence occurring in the project groups centering on the following aspects:

(i) Role types taken on by members in the group;
(ii) Role expectation of members;
(iii) Group roles and group norms;
(iv) Group roles and group communication;

4.1 Types of Roles taken on by Members in the Group

Roles are the part that group members take as they interact. Different roles concur to make the group function and develop. In the project groups of this study, some members took on the leading roles, and some took on the supporting roles. Nonetheless, roles were not deliberately created. The roles, as reflected in the interview and written data, emerged and evolved naturally as the groups developed.

The classic typology developed by Benne and Sheats (1948, 2000) in differentiating the nature and functions of group roles was adopted as the framework for analyzing role types in this study. Based on students' accounts in the interviews and personal reflective writings, five types of roles were identified: *Leader, Initiator, Elaborator, Harmonizer,* and *Follower*. Explanation on how the role categories were re-grouped from Benne and Sheats' (1948, 2000) typology was provided in Chapter 2 (Table 2.1) and Chapter 3 (Figure 3.1).

In Benne and Sheats' (1948, 2000) typology, Leader, Initiator and Elaborator are "task roles", which refer to members performing behaviors that promote completion of tasks and activities, including initiating structure, providing task-related feedback, setting goals,

and so on. It focuses on the group's goals and on the members' attempts to support one another as they work (Forsyth, 2010). Harmonizer and Follower are "*relational roles*", which refer to members performing behaviors that improve the nature and quality of interpersonal relations among members, including showing concern for the feelings of others, reducing conflicts, enhancing feelings of satisfaction and trust in the group, and so on (ibid).

In the interviews, students were asked to describe their roles in the group, and were also asked about the roles that the other members were playing. The descriptions were cross compared, mapped onto the descriptions of each role category, so as to identify a role that most suited to what was described. Below are a few examples of this role identification process (c.f. Table 4.1).

Table 4.1: Examples of role identification for members in the project groups
(Members' saying are extracted from the individual interviews)

Members providing descriptions for their role in the group	**Other members' descriptions on the role**	**Role identified**
Yuet (Group A): "I encouraged members to speak up, stimulated opinions, and also regulated discussions." "I was the leader. I led discussion, followed-up on work, scheduled meetings, coordinated members, and monitored work progress. "	*Wan* (Group A): "***Yuet*** was the key figure. She led the group, stimulated members to express views, regulated discussions when the situation was confused and messy."	Leader
Ho (Group A): "Nothing special for me. I just made suggestions, put forward my views, and asked questions etc."	*Yuet* (Group A): "***Ho*** was very good at making elaborations on an idea raised by us. He was also capable of drawing conclusions from our discussions."	Elaborator
Suet (Group B): "My role was like that of a co-leader. I had proposed a lot of innovative and interesting ideas. I participated in group discussions actively, and always stimulated others to speak. I	*Ying* (Group B): "***Suet*** took a very active role in the group. She was willing to speak up by initiating interesting and creative ideas. She always elaborated and supplemented to our views."	Initiator

did have influence on the group decisions."		
<u>*Ying* (Group B)</u>: "I tended to oblige to decisions. I was an executer rather than a planner. I usually worked behind the scene as a third-line worker." "I liked my function in balancing other members' view, trying to understand their needs, and saying jokes in energizing members."	<u>*Ma* (Group B)</u>: "***Ying*** was a laughing stock in our group. She energized us, balanced our views, and gave us a lot of fun."	Harmonizer
<u>*Yin* (Group C)</u>: "I seldom spoke up in the discussions. I tended to listen more than to speak. I was used to be abstained from taking part in arguments and debates occurring in the group. At the final stage of the project work, I tried to force myself to speak up more. I was able to do so because I was more committed at that time."	<u>*Yi* (Group C)</u>: "***Yin*** was a quiet member. She did not say too much, and appeared to be slow in making response to what was discussed."	Follower

The roles taken on by members in the project groups of this study are summarized in Table 4.2.

Table 4.2 : <u>Role distribution in the project groups of this study</u>

	Task Roles			**Relational Roles**		
	Leader	**Initiator**	**Elaborator**	**Harmonizer**	**Follower**	**Total**
Group A	*Yuet*	*Hei*	*Ho*	---	*Wan*	**4 members**
Group B	*Ma*	*Suet*	---	*Ying*	*Yan & Yuen*	**5 members**
Group C	*Yi & Shing* (Co-leaders)	---	*Suen*	*Ting*	*Yin*	**5 members**
	8 students			**6 students**		**14 students**

Information in Table 4.2 showed that there were both task roles and relational roles in the groups. According to Forsyth (2010), members in a group would gravitate toward either a task role or a relational role. In Benne and Sheats' view (1948, 2000), for a group to survive, it must meet two basic demands: the group must accomplish its tasks, and the relationships among members must be maintained. Based on this, with both task role and relational roles existing, the project groups had met the conditions for group survival.

Table 4.2 also showed that there were slightly more students taking on the task role (*task roles: 8 students; relation roles: 6 students*). Group A and Group C had more task roles, possibly indicating that these two groups were more task focused. Group B had more relational roles, possibly indicating that this group was more relation focused. According to Forsyth (2010), people taking on task roles tend to "offer mostly suggestions and expressed opinions. ..... elicit more questions, displays of tension, antagonism, and disagreement" (Forsyth, 2010, p.152); whereas people taking on relation roles tend to have "more demonstrations of solidarity, tension reduction, and solutions to problems" (ibid).

4.2 Role Expectation of Members

Roles were not assigned and not specified when the project groups started to form. Group roles emerged as the groups evolved. In interviewing the group members, it was found that among the 14 students, 7 of them admitted that they did not have a role expectation at the beginning, but eventually were able to identify a role in their group. The other 7 had a role expectation before joining the group, and 6 were able to achieve their role expectation. Only one, who originally expected herself to be the Leader, ultimately was unable to reach her expectation. The role expectation of members is summarized as follows:

(i) Category 1: (7 students)

- Members did not have a role expectation at the beginning, but subsequently were able to identify a role in the group.

(ii) Category 2: (6 students)

- Members had a role expectation, and subsequently are able to accomplish the expected roles.

(iii) Category 3: (1 student)

- Members had a role expectation, but subsequently were unable to achieve the expected roles.

For category (1), students like *Ting* (Group C), who did not have a role expectation at the beginning, but then identified the role as Harmonizer in the group. She was satisfied with this role. She said,

> "I acted as a balance to the group. I had not thought of taking up a role when I joined the group. When I noticed that the other three members were so strong and insistent on their views, I thought it was better for me to input an abstaining angle to balance the opposing views. I took on this balancing role naturally. I was happy to contribute in settling disputes with my neutral position."
>
> (*Ting*, Group C, in interview)

For category (2), students like *Ying* (Group B) had expected to take on the role of a Harmonizer to input humor and jokes for energizing members if the atmosphere was dull, or when arguments occurred in the group. She was happy in taking up this role:

> "I knew I would not be the Leader, because *Ma* has possessed all those leadership qualities. … I am happy to be an energizer to the group with my jokes and humors."
>
> (*Ying*, Group B, in interview)

Wan (Group A) was in category (3). In the interview, she admitted that she wanted to be the Leader but failed to achieve her role expectation. As the group evolved, she became the Follower, refraining from initiating ideas in the group. She described her group experience as follow:

> "I regretted for not putting more effort on the project. I should not be afraid of putting forward ideas. If I were given a second chance, I would be more insistent on my

> views. … This project experience had confirmed to me that I am not interested, and shall not work in the media field. … I am aware that good friends might not be good collaborative partners." (*Wan*, Group A, in interview)

There was the intrinsic factor –*Wan*'s personal character, and extrinsic factor – group socialization, that might have led to her failing in accomplishing her role expectation as Leader. *Wan's* sharing of her perceptions in the interview was potential evidence for her lacking in the aspiration and qualities required for a Leader:

(i) *She appeared to be lacking in readiness for the leadership role:*

> "I was like dreaming when the group was formed. Frankly speaking, I was not too committed, and not contributing my full effort in the job."
> (*Wan*, Group A, in interview)

(ii) *She appeared to be lacking in self-confidence:*

> "In group discussions, I was always the last person to present views. I did it purposely, because I wanted to listen to others' view first before I proposed mine. I felt more safe to be the last one to speak. … I have to say, sometimes I could not follow and did not understand what the others were discussing." (*Wan*, Group A, in interview)

(iii) *She appeared to be lacking in positivity on group members:*

> "I was not sure whether the other members were contributing equal effort on the project. After all, it was group work and not individual work. You may say I had some mistrust on them." (*Wan*, Group A, in interview)

Readiness, self-confidence and positivity are some basic qualities of a leader (Forsyth, 2010; Johnson and Johnson, 2009). As Johnson and Johnson (2009, p.180) pointed out, "individuals who have the energy, drive, self-confidence, and determination to succeed will become leaders." The door of the leadership role may not be open to those who lack these personal qualities.

Group socialization was probably the extrinsic factor for *Wan*'s non-accomplishment of

the role expectation of leadership. Group socialization is the negotiation of roles between individuals and the group (Moreland et al. 1996). Individual members may seek the Leader role in a group, but the group may not permit them to occupy the role. *Wan* was in that situation. It was not the other members rejecting her, but the other members were so enthusiastic and conscientious that they were eager to speak up and present their views in group discussions. Discussions were so rigorous and spontaneous that it was difficult for *Wan* to follow and chime in.

Roles influence group members' happiness and well-being. Different roles are associated with different degree of status, and status is related to power. High-status members usually have power and a stronger influence over group decisions and judgments (Johnson and Johnson, 2009). People usually prefer to occupy roles that are prestigious and significant. Failing to do so, they will loose motivation. According to *Wan* (Group A), on fearing her views being less valued and ignored, she had refrained from speaking up, thus losing the drive to be the Leader.

The implicit leadership theory (Lord et al., 1986; 1991) suggests that individuals who act in ways that match the group members' leader prototypes are likely to emerge as leaders. Another member in Group A, *Yuet*, emerged as the Leader due to her behaviour matching with the leader prototypes.

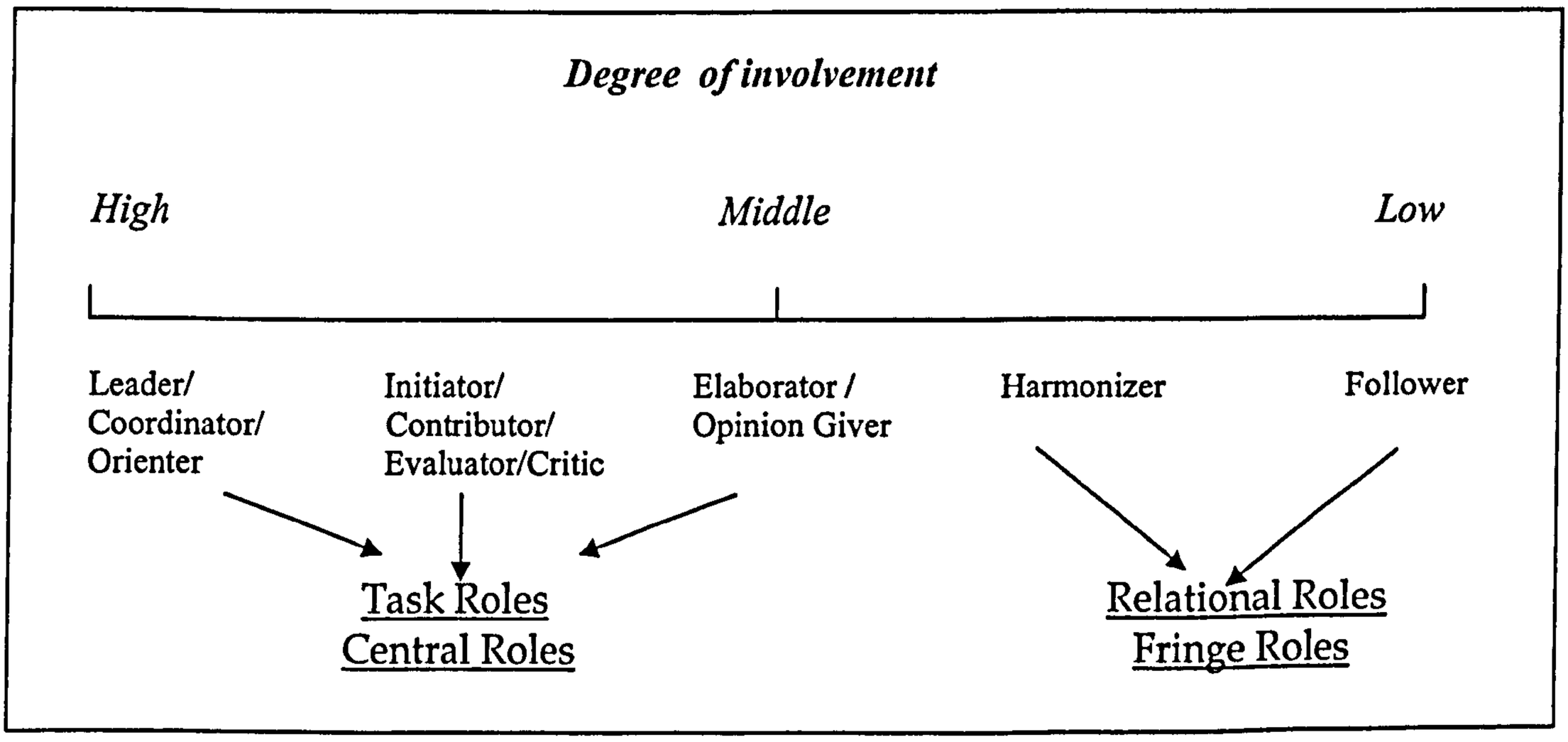
4.3 Group Roles and Group Norms

Roles are to differentiate members' functions and obligations from one another, while norms are to integrate actions of all group members. Roles are expectations governing the appropriate behavior of an occupant of a position, and norms describe the kinds of behavior that members usually perform, and define what most members would do, feel or think (Johnson and Johnson, 2009). Roles and group norms are inter-related. Norms are the emergent and consensual standards that regulate group members' behaviors (Forsyth, 2010). They are manifestation of cultures, characteristics and attitude of a group.

4.3.1 Roles and degree of involvement

According to Forsyth (2010), members taking on *"task roles"* (Leader, Initiator, and Elaborator) tend to "offer mostly suggestions and expressed opinions. ….. elicit more questions, displays of tension, antagonism, and disagreement" (Forsyth, 2010, p.152). Lickel et al. (2000) also found that groups that were task-focused usually engaged with goal-focused learning, and the members were united in pursuing common goals and outcomes. Hence it may be inferred that members taking on the task roles will have higher degree of involvement in group discussions, as task roles are considered as central roles in the group. On the contrary, members taking on the *"relational roles"* (Harmonizer and Follower) will have a lower degree of involvement as relational roles are considered as fringe roles in the group. This inference is presented by Figure 4.1 at below.

Figure 4.1 : Inferences on degree of involvement in relation to role distribution



Degree of involvement is related to group norm. Higher degrees of involvement of members may indicate that there is cohesiveness and unity, which will most likely lead to

healthier group norms. If members are passive and are not involved in group discussions, group norms will unlikely be satisfactory.

4.3.2 Roles and group structure

Members need to perform different functions and play different roles in a group. They are interdependent and will influence each other. It can be argued that there has to be role equilibrium for a group to achieve a desirable group culture. According to the Equilibrium Theory (Bales, 1953), effective groups must maintain a balance between task and socio-emotional activity. That means there has to be a balanced distribution of task roles (or central roles) and relational roles (or fringe roles) in a group. Imbalance of role distribution may inhibit the group's ability to achieve its goals, and role equilibrium will let a group benefit from members' equal participation and cooperation rather than exploiting and loafing on others' efforts (Johnson and Johnson, 2009). Based on this, inferences on the group structure in relation to the role distribution can possibly be made on the project groups of this study as follow (Table 4.3):

Table 4.3 : Inferences on group structure in relation to role distribution in the project groups of this study

	Group A	**Group B**	**Group C**
No. of task roles/ central roles	3 (Leader, Initiator, Elaborator)	2 (Leader, Initiator)	3 (Co-leader, Elaborator)
No. of relational roles/ fringe roles	1 (Follower)	3 (Harmonizer, Follower)	2 (Harmonizer, Follower)
Inferred group structure			
Members' degree of involvement	Inferred as **high**, for there were more task roles than relation roles.	Inferred as **low**, for there were more relational roles than task roles.	Inferred as **moderate**, for there was equal number of task roles and relation roles.
Disputes in the group	Inferred as **having fewer** disputes, for Harmonizer did not emerge.	Inferred as **having some**, for Harmonizer had emerged.	Inferred as **having some**, for Harmonizer had emerged.
	Inferred as **having strong**	Inferred as **not having**	Inferred as **having strong**

Traits of role equilibrium in the groups	**traits** of role equilibrium, participation was likely equal, for there were more central figures than fringe roles.	**strong traits** of role equilibrium, participation was likely less equal, for there were more fringe members than central figures.	**traits** of role equilibrium, participation was more likely equal, for there were more central figures than fringe roles.
Group focus	Inferred as focusing **more on the task,** for there were more task roles than relational roles.	Inferred as focusing **more on relation,** for there were more relational roles than task roles.	Inferred as focusing **more on the task,** for there are more task roles than relational roles.

The inferences in Table 4.3 may give rise to an understanding of group structure in the project groups of this study as follow:

(i) Group A:

It has a more satisfactory group structure, because the desirable elements, such as harmony, high degree of involvement, strong traits of role equilibrium and equal participation, existed in its group structure. In a group like this, members would likely have a positive experience, and tend to be more fruitful on task accomplishment.

(ii) Group B:

Its group structure seemed to be not as desirable as Group A. There might possibly be arguments, members tended to have a lower degree of involvement, and there were fewer traits of role equilibrium. With a group structure like this, members would likely have a less positive group experience, and possibly be spending more effort on relational matters.

(iii) Group C:

The group structure could be considered as satisfactory, as there was a high degree of involvement, traits of role equilibrium and equal participation. However, there seemed to be traits of disputes in the group. With a group structure like this, members' experience in group processes would possibly be moderately good.

The above discussions and inferences show that collaborative groups with more desirable structure seemingly are groups that are task focused, with a high degree of involvement

of members, with traits of role equilibrium and equal participation. These groups will likely bring about better group experience. Like in Group A, its members admitted in the interview that they had good experience in the project group processes. When describing how they felt about their group experience, members tended to provide positive descriptors like "*happy*", "*joyful*", "*accommodating diversified opinions*", "*clarity in division of labor*", "*solidarity*", "*unity*", and so on. Table 4.4 has summarized the descriptions provided by members of Group A on their group experience as shared in the interview.

Table 4.4: Descriptions provided by members of Group A on their group experience in the interviews

Members of Group A	Descriptions		
	In general	**On group relationship**	**On the division of labour**
Yuet **(Leader)**	a happy group	-no conflicts, disputes, hatred and hostility -can accommodate diversities of personalities and abilities	
Hei **(Initiator)**	a joyful group	with unity and solidarity	clear and fair division of labour
Ho **(Elaborator)**	a group with conscientiousness and initiatives	-happy cooperation -can integrate playing and working together	clear and fair division of labour
Wan **(Follower)**	a group with diversified personalities and abilities	has experienced ups and downs	

These positive descriptions on group experience could also be found in the individual written retrospective reflections:

- "I have been working happily on this group project. It is truly a happy learning experience for me!" (*Yuet*, Group A, written personal reflection)

- "I always recall the project experience. I treasure the group experience, and will not forget the process in working with my group members."

(*Wan*, Group A, written personal reflection)

- "I enjoy the collaborative process. … I am really happy in having completed the project task together with my groupmates." (*Hei*, Group A, written personal reflection)

- "The whole working process was happy and enjoyable. … There was not any unpleasant incidents in our group." (*Ho*, written personal reflection)

4.4 Group Roles and Group Communication

It can be argued that effective communication is the prerequisite for every aspect of group functioning. To achieve collaboration, group members need to interact and work together (Saltiel, 1998, Baldwin & Austin, 1995), to dialogue and converse in constructing shared meanings (Isaacs, 1993, 1999). It has been argued earlier on, that groups with more task roles/central roles tend to bring about a higher degree of involvement of members, thus leading to more desirable group structure and better group norm. This argument can be substantiated by examining the way that distribution of group roles affects group communication.

It was observed in several discussion episodes of Group A that there was high interaction level among members, and almost every utterance by an individual member could evoke a response from one another. Below is an example of the communication pattern occurring in Group A (Excerpt 4-4-1).

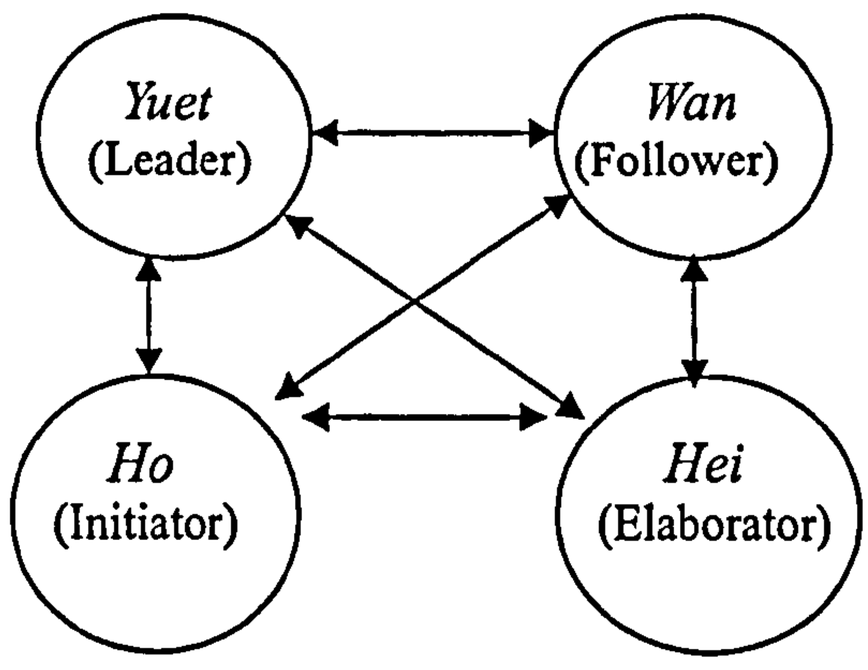
Discussion Excerpt 4-4-1 *(Group A: Discussing page ordering of the magazine)*

Yuet	:	Four pages will look like this. I have designated four pages to you already, do you understand?	*—Kicking off discussion*
Hei	:	The page is for contingency purpose.	*—Responding to Yuet's question*
Wan	:	Can the article be put and start from this page?	*—Responding to both Yuet and Hei's questions*
Yuet	:	The "restaurant article" has already started from this page.	*—Responding to views raised*
Ho	:	It is too much!	*—Responding to views raised*

Hei	:	If like this, will 8 pages be adequate to accommodate the article?	*—Responding to views raised*
Wan	:	I think leaving more space to the page is better.	*—Responding to views raised*
Hei	:	Yes, yes, more space is better.	*—Responding to Wan's views*

In the above episode, every member participated in the discussion. When the Leader, *Yuet*, initiated an idea, the other members all contributed in providing feedback and comments. The communication was not just in pairs which only elicited two interactions, but in quads, which elicited multiple interactions (c.f. Figure 4.2).

Figure 4.2 : Multiple interaction pattern in Group A



Multiple interactions pattern allows members to respond to one another's views, so that cumulative reasoning will be achieved by means of seeking clarification, questioning, and adding new perspectives. Participation is fluid and interactive in multiple interactions pattern.

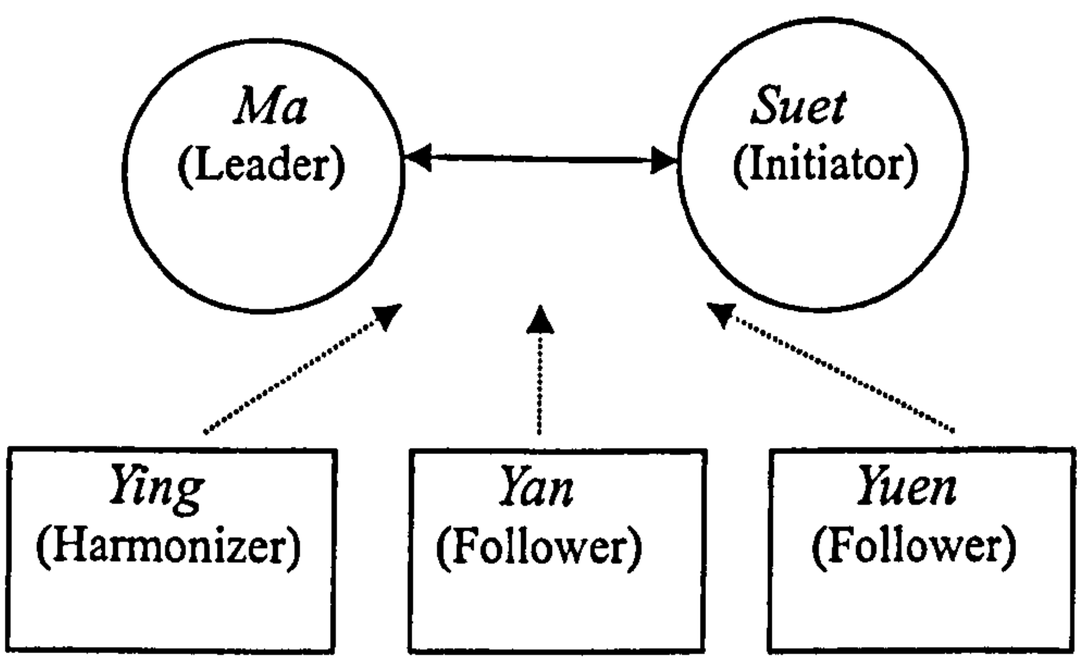
There was a counter example in Group B, in which members appeared to be less interactive in discussions. Members taking on the Leader and Initiator role tended to dominate the discussion (c.f. Excerpt 4-4-2).

Discussion Excerpt 4-4-2 *(Group B: Discussing how to deal with an interviewee's request)*

Ma	:	You told us he wanted us to send the interview outline to him, isn't it? Did he mean to get the detailed questions from us?	—*Initiating question about the arrangement of the interview*
Suet	:	I have told him that we are quite in a hurry, so we can only send him the outline. But do we need to send the detailed questions to him before interview?	—*Responding to Ma's question*
Yuen	:	No need.	—*Responding to Suet's question*
Ma	:	The interviewee might need it.	—*Responding to Yuen's view*
Suet	:	But teacher said it will be fine if the outline is sent first, and then send the details later on.	—*Exchange between Suet and Ma*
Ma	:	Oh, what? Does he need the detailed questions?	—*Exchange between Ma and Suet*
Suet	:	He wants to read the questions before interview. If you've got ten questions, then send him ten.	—*Exchange between Suet and Ma*
Ma	:	does he want to prepare answers for the questions?	—*Exchange between Ma and Suet*

In the above episode, discussion was led by *Ma* (the Leader) and *Suet* (the Initiator). They did most of the talking in responding to the views of each other. The other three members had limited input only. Sometimes it was *Yuen* (Follower), sometimes it was *Ying* (Harmonizer), and sometimes it was *Yan* (Follower) who put forward a view to respond to what *Ma* (the Leader) and *Suet* (the Initiator) said. Evidence showed that members with the role of Harmonizer and Follower did not have active participation in group discussions: The interaction pattern of members in Group B is presented in Figure 4.3.

Figure 4.3 : Interactive pattern among members in Group B



The interaction in Group B was not multiple. The communication appeared to be single-looped, for there was a predominance of the central figures (Leader and Initiator) in group communication. The other members who took on the fringe roles appeared to be communicating with the central figures more than interacting among themselves.

The differences of communication pattern in Group A and Group B had given rise to the following understanding:

(i) ***Who talks, how often, and for how long***

In the project groups, there were members who talked more and longer, and who talked less and not as frequent. As central roles and task roles, the Leader, Initiator, and Elaborator usually talked more. As fringe roles and relational roles, the Harmonizer and Follower usually talked less. As Johnson and Johnson observe, the central figures are usually "more satisfied with the group's work than members who occupy fringe positions" (Johnson and Johnson, 2009, p.155).

In the project groups of this study, the Leaders tended to have a higher frequency of communication and produce longer utterances. It may be due to the greater amount of information they possessed. They talked more because it was their responsibility to monitor the discussion flow. From a dialectical point of view, the Leader, who occupies a central position usually has more information, and the information has often led them to emerge as Leader (Johnson and Johnson, 2009).

Leader, Initiator and Elaborator, as the central figures, tend to offer suggestions, express opinions, elicit questions and display responses (Forsyth, 2010). More central roles in a group will be more likely to bring about multiple interactions for the group. Group A had three members taking on the role of Leader, Initiator, and Elaborator (*3 central roles)*, and one as Follower (*1 fringe role)*, hence the talking frequency among members in Group A was found to be more even, and they had a high degree of involvement in the group.

Group B had one Leader, one Initiator role (*i.e. 2 central roles)*, one Harmonizer, and two Followers (*i.e. 3 fringe roles)*. The talking frequency appeared skewed to the Leader and Initiator. The central figures dominated group discussions, and the degree of involvement of the fringe roles was relatively lower. It could be inferred that groups with more central figures would have more even participation and higher degree of involvement in discussions; and groups with more fringe roles would have less participation and lower degree of involvement.

(ii) ***Who communicates to whom***

As discussed above, Group A operated in a multiple interactions pattern, which allowed for free and multi-targeted interflows among members. Whenever one member spoke another might interrupt the speaker and respond to what he/she was saying. Group A had a more balanced communication level that every member had equal participation in discussion.

In Group B, it was the Leader (*Ma)* and Initiator (*Suet*) who exchanged utterances more often than the others. The other members appeared to have less input in the discussions. If there were any comments, the comments were mainly responding to what the Leader or Initiator said. Communication in Group B seemed skewed to the central figures. The participation did not seem equal. As Johnson and Johnson (2009) pointed out,

> "Knowing who interrupts whom gives the observer clues as to how members see their own status or power in the group. Generally high-authority members feel freer to interrupt low-authority members than vice versa."
>
> (Johnson and Johnson, 2009, p.147)

Based on this, members of Group A could be inferred as having a better perception of their own status in the group, and it was brought about by the perceived equal power among group members. It further affirmed that the group norms and structure of Group A was more desirable as there were traits of role equilibrium, members had high degree of

involvement, and there was multiple interactions and equal participation in the group. Members' retrospective reflections also reflected that they had gone through the group experience that was "*happy, joyful, and with initiatives*" (c.f. Table 4.4 above).

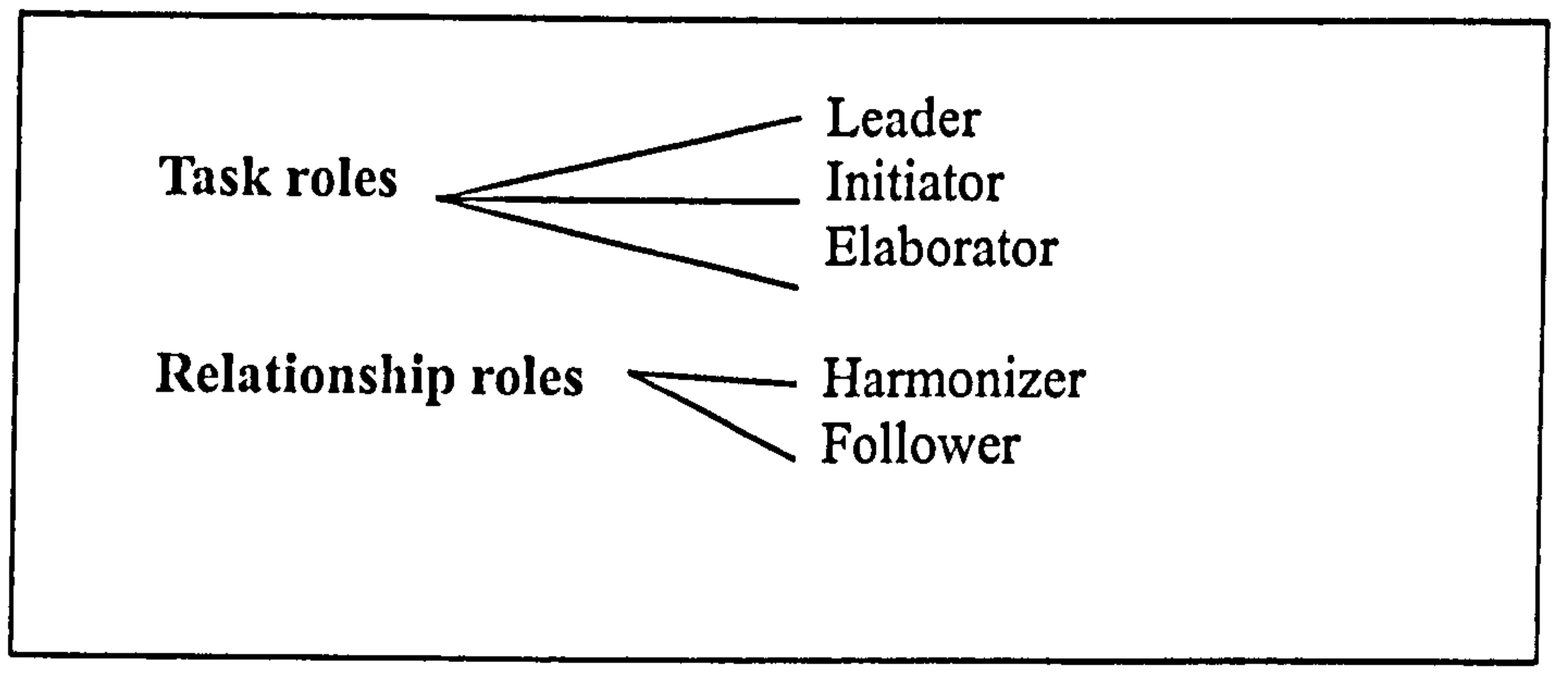
In Group B, there was likely the existence of power hierarchy, and so leading to the less equal participation among members. With higher authority and more power, the Leader and Initiator became the central figures in dominating group discussions. The other members, who were Harmonizer and Follower, might see themselves as playing a fringe role, thus not feeling free to interrupt utterances of the central figures. It further affirmed that the group norms and structure of Group B was less desirable as there were less traits of role equilibrium, members had lower degree of involvement, and multiple interactions or equal participation seemed not always existed.

4.5 Chapter Summary and Conclusion

This chapter has provided a discussion on four aspects of role interdependence in the project groups under study: (i) Types of roles taken on by members in the group; (ii) Role expectation of members; (iii) Group roles and group norms; and (iv) Group roles and group communication.

It has been identified that there were five types of roles: *Leader, Initiator, Elaborator, Harmonizer, Follower* (Benne and Sheats, 1948, 2000), which could be categorized into *"task roles" and "relationship roles"* (Forsyth, 2010) (c.f. Figure 4.4). Some members had role expectations when the groups were formed and some did not. They eventually could identify a role to play in the group.

Figure 4.4 : Role types in the project groups



In the project groups under study, there were a higher proportion of members taking on the task roles than the relational roles. Studies have demonstrated that "a combination of behaviors, task-and relationship-focused do seem to have an important role in the effectiveness of the groups" (Yamaguchi and Maehr, 2003, p.14). It was argued, therefore, for a group to survive, it must meet two basic demands: the group must accomplish its task, and the relationships among members must be maintained (Benne and Sheats, 1948, 2000). So role equilibrium will perhaps make it more likely that a group will survive.

Evidence from this chapter tends to suggest that multiple interactions pattern was potentially more desirable for achieving collaborative discussion for the project groups. The multiple interactions pattern allowed for clarifying, questioning, explaining, adding on new perspective, and thus leading to cumulative reasoning for the group. The multiple interactions pattern required high degree of involvement and equal participation among group members. It was found that groups that had a higher proportion of members taking on the task roles (or central roles) as Leader, Initiator or Elaborator, who can promote completion of tasks and activities by focusing on the group's goal, could potentially engage in the multiple interactions patterns. Groups that had a higher proportion of relational roles (or fringe roles) as Harmonizer and Follower would less likely engage with multiple interactions pattern. Members of the collaborative learning groups could perhaps be empowered to take on central roles rather than staying with the fringe roles.

The analysis can be argued as evidence that groups with more members taking on the task roles (or central roles) as Leader, Initiator and Elaborator, will more likely lead to multiple interactions patterns, equal participation and high degree of involvement in group discussions. In such groups, power hierarchy may be less likely to exist as members tend to have a better perception of their own status. Groups of this kind will more likely lead to desirable group norms. Whereas groups that have more members taking on the relational roles (or fringe roles) as Harmonizer and Follower, will more likely be dominated by the Leader and Initiator, and when a response was made, it is often directed to the central figures. Groups like this will more likely lead to less desirable group norms.

In summary, the findings may suggest that members in a collaborative group can possibly be encouraged to refrain from taking on the fringe roles for the sake of constructing desirable group norms. The evidence presented here tended to indicate that desirable group structure and better group experience is likely to occur with the following conditions:

(i) There are more task roles/central roles than relational roles/fringe roles in the group.

(ii) The group has a task focus.

(iii) Members have equal participation and high degree of involvement.

(iv) The group is engaged with the multiple interactions communication pattern.

Chapter 5 : Cognitive Reasoning in Group Discussions

Discussion in Chapter 4 suggested that role structure had influence on the group norms and interaction patterns of the project groups. Groups with more members taking on the task roles (or central roles) as Leader, Initiator and Elaborator, would more likely lead to multiple interactions patterns, equal participation and high degree of involvement in group discussions. It was also argued that multiple interactions pattern was potentially more desirable for achieving collaborative group discussions, for it would help to enhance discourse in clarifying, questioning, explaining, adding new perspectives, and thus leading to cumulative reasoning for the group.

This chapter will go on to analyze the project group discussion for the sake of obtaining a further and more in-depth understanding of the dialogue interactions to see whether cognitive reasoning occurs in group discussions, and how members coordinate the diverse views to address a complex task. The analysis of this chapter is based on the belief that:

- collaborative discussion is an effective tool for deep learning and higher-order learning (Visschers-Pleijers et al., 2006);
- solutions of problems are jointly produced in dialogues in which knowledge is co-constructed by a process of negotiation (Nguifo, Baker & Dillenbourg, 1999);
- Argumentation in group discussions can be a tool for fostering reflection and deep thinking, and this collaborative process will tend to result in higher achievement, and more frequent use of higher-level reasoning and meta-cognitive thought (Johnson, & Johnson 1989; Johnson, Johnson, & Smith, 2007).

By analyzing the discussion protocols, three discourse forms were identified: (i) Exploratory questioning; (ii) Elaborative explanation; and (iii) Problem solving and decision making.

5.1 Exploratory Questioning in Group Discussions

Analysis of student dialogues n the project group discussions had led to the understanding that questioning was used for exploratory purpose in: (i) eliciting information; (ii) generating new ideas, and (iii) evaluating ideas.

5.1.1 Questioning for eliciting information

Questioning for eliciting information was commonly found in the discussion sessions of the project groups of this study. It served the following functions:

(i) ***Seeking confirmation or clarification***

When a member put forward a view that was vague, questions such as "*Could you be more specific?" "What do you mean when you say ...?" "I don't quite understand. Could you say that once more?*" would be asked. Excerpt 5-1-1 is an example where a series of questions were being raised to seek confirmation and request for more concrete explanation:

Discussion Excerpt 5-1-1 *(Group A: Discussing about page ordering)*

Hei :	The page ordering always remain the same for all magazines.	—*Initiating idea*
Wan :	Does it mean there is no need to consider the contents of the articles?	—*seeking clarification on what the idea really means*
Ho :	Do you mean there are different importance levels for each article?	—*seeking clarification on what the question means*
Wan :	Can you tell me how to make judgment on the importance level of an article?	—*asking for more concrete explanation*

In the above episode, *Hei* started off by putting forward an idea. Then *Wan* raised a question asking him to clarify the concept. *Wan*'s question then inspired *Ho* on developing a new perspective. *Wan*'s interest seemed to be aroused by *Ho's* idea, and so asked him to explain further. The scenario in the above episode has given rise to an

understanding that a series of questions can be provocative. It can be argued that it is potentially a fruitful and effective type of questioning in stimulating thinking and alternative perspectives.

(ii) ***Demanding justifications or verifications***

When a member put forward an idea which was not quite agreed by the other members, then they would ask for justifications, such as "*May I ask why*?" "*Could you quote some examples?*" In the following episode (Excerpt 5-1-2), *Hei*'s question presented his query on a decision suggested by another member. He demanded justifications for that decision.

Discussion Excerpt 5-1-2 *(Group A: Discussing about allocating pages for an article)*

.....		
Hei :	Is 8 pages really suitable for putting the article in?	—*Raising question in demanding justifications for allocating so many pages for the article*
.....		
.....		
Yuet :	I think more spacing for the page layout will give more breathing space to readers. I read the *Ming Pao Weekly* quite often. I find its pages contain a lot of spaces. It won't let you feel being pressed or too tense. It gives readers a comfortable feeling. The teacher also reminds us to leave enough space for the pages. So don't cram too many words in one page.	—*Being evoked by the question and giving justifications*

In the above example, *Hei's* question had given *Yuet* a chance to explain her rationales on arranging the page layout like that. In explaining, *Yuet* had gone through a thinking-aloud process in which she could come up with clearer thoughts on what she wanted to achieve. Hence demanding justifications and verifications by questioning may help to eliminate misconceptions for the group.

(iii) *Inferring or confirming knowledge*

Sometimes questions were for inferring and confirming what was said by another member. It helped to eliminate possible miscommunication in the group. For example:

Discussion Excerpt 5-1-3 *(Group A: Discussing about page ordering)*

Yuet :	I think those shorter articles can be put at the back.	—*Initiating an idea*
Hei :	Do you mean the more important ones being put at the front?	—*Questioning for confirming what has been said*
Yuet :	Perhaps in between the heavy ones we can also Insert a few lighter articles.	—*Adding on ideas*
Ho :	Do you mean putting articles in the *"light-heavy-light-heavy"* order?	—*Questioning for confirming what has been said*
Yuet :	Yes, I think it is better. If all the light ones at the back, it will be too light; if all heavy articles are at the front, the front part will be too heavy.	—*Confirming the inference*

In the above example, *Hei* and *Ho*'s questions were to make sure that their interpretation on *Yuet*'s idea was accurate. The questions had given *Yuet an* opportunity to explain and justify so that her message would not be mis-communicated and misinterpreted.

As Webb (1995) pointed out, questions that can trigger members to check each other's information and to provide explanations and justifications are considered as higher-order questions. The discussion excerpts of 5-1-1, 5-1-2 and 5-1-3 may serve as evidence that the project groups were engaged in high cognitive reasoning in using higher-order questioning in discussions.

5.1.2 Questioning for generating new ideas

Questioning for generating new ideas is a form of positive questioning which provokes thinking and stimulates creativity among members in the group. As seen from the group discussion episodes, there were a few incidents in which members were found to be engaged in this type of questioning. Excerpt 5-1-4 gives one example.

Discussion Excerpt 5-1-4 *(Group A: Discussing the naming of headings)*

Hei :	We can use some vocabulary groups to name the topic headings, such as "*Clothes-Food-House-Vehicle*", so simple!	—*Initiating idea*
Yuet :	Anything else? "*Spring-Summer-Autumn-Winter*" or "*East-South-West-North*"?	—*Questioning to provoke new ideas*
Wan :	What is the advantage of using such vocabulary set?	—*Questioning for alerting members to consider the idea from the good side of it*
Yuet :	It sounds more interesting to readers. It also makes the articles appear to be more structured.	
Hei :	Our magazine will not be boring.	
Ho :	But any shortcomings in using this method?	—*Questioning for alerting members to consider the idea from the bad side of it*
Wan :	It may not be easily understood by readers.	

The above example illustrated a piece of discussion in which new ideas were generated through a series of questions raised by different members in the group. At the start *Hei* proposed a set of terms for naming the topic headings. *Yuet* then provoked members to think about "*something else*" by reminding them no need to be bounded by *Hei*'s suggestion. *Wan* followed up by questioning the advantages of adopting *Hei* and *Yuet's* ideas. *Ho* then raised another question by querying the shortcomings of the suggestion.

Veerman et al. (2002) found that question generation mechanism could give better insights in causes and effects, because questions may help to enact context and situations in relation to their task or problem. The series of dialogues in the above example may have demonstrated that questioning was useful in generating new insights when members were provoked by each other to think from different angles, such as: advantages and shortcomings, cause and effect etc. This can be argued as a form of cumulative reasoning exhibited in group discussion.

Excerpt 6-1-5 is another example demonstrating how group members used a series of questions in generating new ideas.

Discussion Excerpt 6-1-5 *(Group C: Discussing on how to handle a topic)*

Yin :	About the uniform article, I plan to write on three discipline teams: the Air Auxiliary Force, Hong Kong Immigration, and the Fire Service.	*—initiating idea*
Ting :	Hong Kong Immigration?	*—seeking confirmation*
Yin :	Yes, Hong Kong Immigration.	
Shing :	How much data have you collected?	*—eliciting information*
Suen :	Did you search from the web?	*—eliciting information*
Yin :	Yes.	
Ting :	Has the web contained all the required information?	*—seeking clarification*
Yin :	Yes, it is.	
Shing :	Is it adequate? Don't tell me there is only one in it.	*—evaluating idea*
Yin :	A bit scarce. The data is presented in relation to the ranks of the officials.	
Shing :	Are you sure the photos will match our needs? Are they consistent with the topics?	*—evaluating idea*
Yin :	Most of the photos are on caps and badges.	
Ting :	That means different ranks will have different caps and Different badges!	*—inferring knowledge*
Yin :	Yes, if rank changes then caps and badges will change.	
Ting :	Why don't we handle it in the opposite direction?	*—provoking thinking*
Yi :	Yes, we can focus on the badges. Through describing the badges then introducing the ranks of the officials !	*—generating new idea*

The above discussion episode served as an example of a group that was with the multiple interactions communication pattern. In the discussion, the degree of involvement of members was high, and the participation was equal. All five members had participated in the discussion. Individual views were attended instantly.

It was a discussion scene demonstrating the use of questioning series in achieving the following purposes:

- Eliciting information: *"How much data have you collected?"*
  "Did you search from the web?"
- Seeking clarification: *"Has the web contained all the required information?"*

- Providing evaluation: *"Are you sure the photos will match our need?"*
- Provoking thinking: *"Why don't we handle it in the opposite direction?"*

The series of questioning and answering was a form of collaborative dialogues, in which situation was clarified, issues were evaluated, inferences were made, members' thinking was provoked, and finally coming up with a solution that could help handling the task.

The above example could be argued as a successful discussion discourse as it exhibited a high degree of reciprocity in interaction, marked by open-ended questions that created contexts for generating extended responses and reasoning processes. This was regarded as indicative of high-level thinking (Nystrand et al, 1997; Soter et al, 2008).

5.1.3 Questioning for evaluating ideas

When someone's reasons is not valid or unacceptable, members will query the inadequacies of his or her views. Such questioning is to evaluate other's ideas, or challenge other's views. One function of higher-order questioning is to trigger members to check each other's information (Webb, 1995; Veerman et al, 2002). Using questions to evaluate each other's idea in group discussion may help to find out the loopholes and shortcomings so as to refine the argument and come up with a better solution. In the project groups under study, members were found to use the following questioning strategies to evaluate other's ideas:

(i) ***Incorporating a judgment into a closed question:***

- "Can this be considered as information collation and coordination? I don't quite understand." (Group A, *Wan* is evaluating *Ho*'s idea)

- "If we split it into two cover stories, will it be too boring, or will it have better effect if we combine the stories into one?" (Group C, *Ting* is evaluating *Shing*'s idea)

In the first example, *Wan* commented on *Ho*'s not having done a proper job in collating

and coordinating the information. But she made the comment implicitly by asking a question instead of using a straight forward statement.

In the second example, *Ting* disagreed with *Shing's* idea of having two cover stories for the magazine. But she did not present her disagreement by a statement, instead she chose to express by a question: "*will it be boring, or will it have better effect ...?*"

In the above examples, both *Wan* and *Ting* appeared to have used questioning, which was softer and less explicit in evaluating other people's views.

(ii) ***Pointing out the lack of other perspectives:***

- "When you were writing the article, did you have the fashion style of the movie star in your mind first, or did you develop the whole idea first, and then inserting the fashion description into the overall structure of the text?"
  (Group A, *Wan* is evaluating *Ho*'s idea)
- "Are the photos matching with our needs? Are they consistent with one another?"
  (Group C, *Shing* is evaluating *Yin*'s idea)

In the first example, *Wan* intended to point out that *Ho* had neglected some other ways in writing the article. She expressed her view through questioning which made the evaluation turn into making a suggestion rather than challenging *Ho* on not being aware of the other alternatives.

In the second example, *Shing* intended to point out that *Yin* had missed the criteria for selecting photos. He presented the view by a question, which helped in softening the evaluation on *Yin's* oversight.

The questioning way that *Wan* and *Shing* used in the above examples could be considered as less threatening and more easily acceptable when evaluating other members' ideas in group discussions.

(iii) ***Avoiding evaluating other's idea by proposing a new one:***

- "Will it be better to talk about the production techniques of the advertisement *(instead of analyzing the contents)?"* (Group A, *Ho* negating *Hei's* idea)

- "As our magazine is with a career focus, so should we incorporate more contents related to job searching, such as making applications, attending interviews and so on *(instead of putting a page of cartoons) ?"* (Group C, *Shing* negating *Suen*'s idea)

In the first example, *Ho* proposed to focus on the techniques rather than on the contents. He tried to avoid making direct evaluation on *Hei's* idea, but put forward another suggestion through a question. In this case, *Hei* would feel less embarrassed as his view was not directly attacked.

In the second example, *Shing* disagreed with S*uen*'s idea in incorporating cartoons into the magazine. He did not express the negation explicitly, but proposed another idea by means of questioning. *Suen* would possibly feel less bad as her idea was not directly evaluated and shot down.

Evaluating other people's ideas may provoke unpleasant feelings. As observed from the above episodes, questioning seems to be a recommendable strategy to help lessen the possible tension aroused by negative evaluation on members' ideas in group discussions.

The above examples indicated that questioning strategies had been positively used by the project groups of this study. Questions were to elicit information and responses, which helped to fill individual gaps in understanding (Tsui, 1992). The group's collective attention and diverse perspectives evoked by the series of questioning helped identify flaws and loopholes of an argument (Milliken et al, 2003). Questioning encouraged the review of old ideas, resolving misunderstandings, and motivating micro-creativity (Chiu, 2008), thus generating new ideas and alternative perspectives. Questioning was also found to be used by group members in evaluating others' ideas. Polite disagreements

were incorporated into the question and expressed indirectly. In doing so, members' face could be saved, and group tension would not be aggravated. Groups would be more likely in yielding better collaboration with polite disagreement than with rude disagreement (Chiu, 2008).

5.2 Elaborative Explanation in Group Discussions

Elaborative explanation is an important part of collaborative discourse, for it enhances the linking of solutions to variables operating in problems, connecting prior knowledge to new information, and placing knowledge into practice (Chizhik, 1998). In making explanations, group members can elaborate misconceptions and consider different view points by "generating connections among ideas and between ideas and prior knowledge" (Nussbaum, 2008, p.349), thus leading to the construction of common knowledge and shared meanings among members of the group.

In the discussion sessions of the project groups under study, elaborative explanation was found to achieve three functions: (i) statement of views; (ii) accumulation of reasoning; (iii) generating connections.

5.2.1 Statement of views

Group discussion is largely on exchanging views and ideas among members. In stating one's view, it is not enough to say, "*I want to choose this as the writing topic, and I'm angry with you for you do not accept my suggestion.*" We must elaborate, "*I have collected a lot of data and I find the topic interesting and meaningful.*" Once the reason is explained, either agreeing or disagreeing with, a solution will be attained. Elaborating ideas and opinions is essential for achieving cumulative reasoning when members integrate, generate connections, and make judgment on other people's views (Kruger 1992; Visschers-Pleijers et al, 2006; Nussbaum, 2008).

As the discussion protocols reflected, elaboration of ideas by members was very common. Explanation involves providing reasons, illustrations and examples, and so the utterances tended to be long and the substance tended to be concrete. The following episode (Excerpt 5-2-1) served as an example to demonstrate how views were stated and exchanged among members in group discussions.

Discussion Excerpt 5-2-1 *(Group C: Discussing whether to include a psychological test in the magazine)*

Ting :	The psychological test can help to fill the pages.	*—Initiating an idea*
Suen :	Only the assessment?	*—Demanding clarification*
Yi :	Perhaps we can design the assessment that is related to career choice, to help readers to choose a suitable career.	*—Adding on and refining idea*
Ting :	I am thinking of writing an introductory Paragraph to provide some basic information on a few popular professions, such as teaching, servicing and so on. It will focus more on interesting aspects such as flexibility in working hours, enhancement of personal growth etc. I shall also assign "stars" to rate each item so as to highlight the characteristics of different professions and indicate the differences among them. Then the psychological test can come in for readers to do. The last part will be on explaining what the test scores mean.	*—Elaborating idea by providing more details and how to go about it*
Suen :	The psychological test is one-off thing. It cannot be a regular column article. You can't use that for every issue.	*—Querying Ting's idea by alerting her the article nature*
Ting :	Yes, I can't use the psychological test to fill the empty pages every time and in every issue.	*—Getting aware and rectifying the misconception*

In the above episode, *Ting* initiated the idea, and followed by a long elaboration on the idea. She tried to provide details in substantiating the idea of psychological test can help to make the magazine sound more interesting. Her explanation was chiefly on how to structure the article so that the psychological test could be fit into it.

Ting's explanation was a thinking-aloud process in which her thoughts could be read and

evaluated. As pointed out by *Suen, Ting* was aware of and able to rectify her own misconception about the positioning of the article that she was going to write.

5.2.2 Accumulation of reasoning

In cumulative reasoning, group members build positively but uncritically on the idea of one another. Accumulation of reasoning promotes cognitive advances as members have the opportunity to integrate ideas and construct new knowledge (Kruger, 1992). It is the basis for reaching shared understanding and common goal for the group. When an individual puts forward a view, the others add on new perspectives and refine the proposal, just like rolling a snowball. This can potentially be helpful in getting a better conclusion, decision, or solution. Accumulation of reasoning requires attentiveness to views, active participation, and prompt responses to opinions. The following episode is an example of the discussion process in which accumulation of reasoning occurred.

Discussion Excerpt 5-2-2 *(Group A: Discussing on how to structure an article)*

Ho :	For writing the "Dragon Gate Restaurant" article, as it is an old restaurant, we have to talk about its history. Naturally it will be structured by historical timeline. When we go inside the restaurant, we have to look for old and traditional things.	*—Suggesting a way to structure the article*
Yuet :	You can also consider using *"Taste and Smell"* to divide the sections for the article.	*—Suggesting an alternative angle*
Wan :	You can also try to write from the angle of *"Mouth", "Eye"* ...	*—Adding on another angle*
Hei :	Try to observe its decorations, from that you can see its history. Whatever you see, try to foreground the historical theme. Just like what we did for the "Tai O" article ...	*—Refining the original idea, and drawing on prior experience to explain*
Wan :	When you write an article, you have to follow the topic and the theme which can guide your writing.	*—Further reinforcing the idea*
Ho :	I agree that the suggested ways are more convenient for data collection. It also ensures the data to be consistent with the theme.	*—Understanding, accepting, and concluding*

The above episode reflected the characteristics of accumulation of reasoning in group discussion as follow:

(i) The group was engaged with the multiple interactions pattern, and had high communication level and dynamic interaction among members. Individual viewpoints were attended and responded. The response was evoked by the previous utterance.

(ii) Additional ideas or alternative angles were very often incorporated in the response. The added ideas or angles stimulated the group to think, and resulted in refining the original suggestion. (e.g. *"You can also consider using "Taste and Smell" to divide the sections for the article." "You can also try to write from the angle of 'Mouth', 'Nose'.")*

(iii) At the end of the reasoning accumulation process, conclusion, solution or direction was attained. (e.g. *"I agree that the suggested ways are more convenient for data collection. It also ensures the data to be consistent with the theme."*)

5.2.3 Generating connections

In giving explanations, members will be "generating connections among ideas and between ideas and prior knowledge" (Nussbaum, 2008, p.349). In the project groups of this study, students were found mostly connecting ideas among group members, and connecting arguments with prior knowledge.

(i) ***Connecting ideas among group members***

In explaining positions, sometimes members would connect their own views with the other members', to illustrate the idea was not a stand-alone one, but had references from the others. The connection gave mandate to one's idea so as to make it more easily

acceptable. As seen from the discussion sessions, group members seemed to have three strategies in connecting ideas among members: (a) demonstrating similarities among ideas, (b) echoing with a proposed view; (c) referring to a previous view.

(a) Example of demonstrating similarities among views:

Discussion Excerpt 5-2-3 *(Group A: Discussing how an article should be structured)*

Ho :	The method is what I call *"All in a Nest"*, that is, all information is displayed, then select the useful ones.	*—Initiating an idea*
Yuet :	My method is in no way different from yours, except that I divide the information into two categories.	*—Pointing out that the two ideas are similar so as to obtain support for her argument*
Hei :	The methods suggested by both of you are in fact the same!	*—Confirming that ideas are the the same, making the suggestions more easily accepted.*

In the above episode, *Yuet* tried to connect her idea with that of *Ho*. The similarities of ideas would possibly gain the likely support for her idea.

(b) Example of echoing with a proposed view:

Discussion Excerpt 5-2-4 *(Group A: Discussing how to handle the interview data)*

Yuet :	What is pros and cons of using this method?	*—Initiating the topic*
Wan :	Low efficiency, this is the disadvantage.	*—Responding to question*
Yuet :	The disadvantage is slow, have to spend more time. Yes, using more time, and only suitable for some ...	*—Echoing with the view*
Wan :	Its advantage is that we can pay more effort in consolidating the data.	*—adding on further view*
Yuet :	Yes, we can handle the data in a moderate pace. We can also consolidate the data at any time and no need to listen to the recordings.	*—echoing with the view again*

In the above episode, *Yuet* connected with *Wan's* by echoing on her idea. Wan also re-echoed *Yuet*'s view by repeating and rephrasing *Yuet*'s words. It seemed that the idea connection had reinforced each other, making the idea appear to be feasible, good, and substantial.

(c) Example of referring to a previous view:

Discussion Excerpt 5-2-5 *(Group A: Discussing on page order of the magazine)*

Hei :	I think it is not a good idea to put nothing on the first page.	*—Refuting Yuet's idea*
Yuet :	No, it is not nothing. I mean, like *Wan* suggested, to put a photo or picture there.	*—Drawing on Wan's previous idea to support her own view*
.....		
Wan :	But just now *Yuet* is right to say... do we really want to leave the last page blank?	*—Connecting Yuet's view to strengthen argument*

In the above episode, when being refuted by *Hei, Yuet* tried to draw on *Wan's* previous suggestion to demonstrate that her idea had got support. *Wan* also connected *Yuet*'s view by endorsing her idea. The connection helped in strengthening *Yuet*'s argument. The connection between *Yuet* and *Wan was a form of* cognitive supporting of each other.

(ii) *Connecting arguments with prior knowledge*

To make one's argument stronger, members in the project groups would draw on prior knowledge for justifying their views. There were three main types of prior knowledge being connected to one's arguments: (a) referring to the teacher's saying; (b) drawing on the experiences of the previous year's cohort; (c) making use of personal knowledge.

(a) Examples of referring to the teacher's statement:

Groups were found to refer to what the teacher said in order to get the views being

accepted. The teacher's statement appeared to be the authority to make members agree and comply with a particular view. It was seen that members tended to take the teacher's words as a guiding light to their project work. In the following examples, the teacher's words were quoted to validate, strengthen and mandate an argument:

- "We can designate a full page for solely putting in the article topic. **Teacher also said** we can use a whole page to do this!"
  (*Yuet,* Group A, discussing about page ordering)

- "**Teacher also said** we can send the interview outlines to the interviewee first, with the detailed questions being sent later."
  (*Suet*, Group B, discussing how to handle the requests from the interviewee)

- "We can combine the smaller topics into a big one. **Teacher said** we can have a big cover story for our magazine."
  (*Yin*, Group C, suggesting ways to consolidate the articles)

- "**But teacher said** the cover story should not occupy half of the space of our magazine!"
  (*Yin*, Group C, reminding the group not to have too many pages on cover story)

(b) Examples of drawing on experiences of the previous year's cohort:

The experience of the previous year's cohort who had similar project experience before also became a connecting point for the groups. Past experience provided a lesson and set an example for the groups to follow. It would enable the groups to avoid committing similar mistakes. Members tended to agree with a view which was made based on the experience of the previous year cohort. Below are the examples:

- "**Students of last year** told me that the written report was more important than the oral presentation."
  (*Ho,* Group A, discussing about preparation of the project report)

- "Did **students of last year** also have to work with 32 pages? Did they find the pages adequate to put in all articles? "
  (*Suen*, Group C, discussing about number of pages for the magazine)

(c) Examples of making use of personal knowledge:

Members also made use of their prior knowledge in justifying a view. Personal experience in reading magazines, watching films, data researching and so on, was the prior knowledge that members used for connecting with their arguments. Below are the examples.

- "I notice that **magazines in the market** tend to place the travel features at the back rather than at the front."
  (*Yuet*, group A, discussing about page ordering of the magazine)

- "When you watch **movie or TV drama**, those exciting highlights are always put at the front part to attract audience."
  (*Wan*, group A, discussing about page ordering of the magazine)

- "**I have seen a photo** showing how dead animals are treated in some western countries. It is really terrible!"
  (*Yan*, Group B, discussing about an interview with an animal funeral service company)

The above examples indicated that different forms of elaborative explanation had been used by the members in discussing their project work. Explanations allowed members to reorganize and clarify materials, to recognize misconceptions, to fill in gaps of members' understanding, to connect ideas, to internalize knowledge, and to develop new understanding and perspectives (Webb et al., 2008). Explanation was also a thinking-aloud process in which members' metacognitive awareness of what they knew and did not know could be developed (Cooper, 1999).

5.3 Decision Making and Problem Solving in Group Discussions

The purpose of decision making in group discussions is to decide on action toward goals that group members wish to achieve. For effective problem solving, members have to

obtain information they need, and then put the information together in such a way that results in an accurate and creative solution (Johnson and Johnson, 2009). Effective decision making and problem solving in collaborative groups requires communication that: (i) promotes sound reasoning and critical thinking (Gouran and Hirokawa, 1996); and (ii) fully utilize the resources of group members (Johnson and Johnson, 2009).

5.3.1 Conditions for problem solving and decision making

There are three conditions identified from previous research literature for problem solving and decision making in the groups (Lemus et al., 2004; Baker, 1999; Schwartz, 1999; Chan et al., 1997; Roschelle, 1992; Brown and Palincsar, 1989): (i) information has to be shared and members' resources are utilized; (ii) groups should have a communication focus on problem solving; (iii) groups should have critical and realistic evaluation of information and alternatives.

(i) ***Information has to be shared and members' resources are utilized***

In solving problems or making decisions, group members must gather the necessary knowledge and resources. Groups are not able to make better decisions because they do not possess the relevant information, or the information is not shared effectively (Sargis and Larson, 2002). Some information is known only to a few members, and each member may have information that no one else in the group knows. Members have to communicate what they know, and other members also have to seek out information from other members.

Some earlier discussion episodes had demonstrated how explorative questioning and elaborative explanation built into cumulative reasoning in the groups. For example, in discussion excerpt 5-1-2, Group A had to make a decision on handling page for their magazine, so *Yuet* tried to share what she knew about page design based on her personal reading experience:

- "I think more spacing for the page layout will give more breathing space to readers. I read the *Ming Pao Weekly* quite often. I find its pages contain a lot of spaces. It won't let you feel being pressed or too tense. It gives readers a comfortable feeling. The teacher also reminds us to leave enough space for the pages. So don't cram too many words in one page."

  (Group A, *Yuet*, solving the problem of page spacing, extracted from excerpt 5-1-2)

Excerpt 5-3-1 is another example of information and resources sharing among members in making decision.

Discussion Excerpt 5-3-1 *(Group A: Discussing on how to structure an article)*

Ho :	For writing the "Dragon Gate Restaurant" article, as it is an old restaurant, we have to talk about its history. Naturally it will be structured by historical timeline. When we go inside the restaurant, we have to look for old and traditional things.	*—Suggesting a way to structure the article*
Yuet :	You can also consider using *"Taste and Smell"* to divide the sections for the article.	*—Suggesting a new angle*
Wan :	You can also try to write from the angle of *"Mouth", "Eye" ...*	*—Adding on another angle*
Hei :	Try to observe its decorations, from that you can see its history. Whatever you see, try to foreground the historical theme. Just like what we did for the "Tai O" article ...	*—Refining the original idea, and drawing on prior experience to explain*
Wan :	When you write an article, you have to follow the topic and the theme which can guide your writing.	*—Further reinforcing the idea*
Ho :	I agree that the suggested ways are more convenient for data collection. It also ensures the data to be consistent with the theme.	*—Making conclusion to the issue*

In the above episode, every member had participated in seeking out different perspectives and ways of tackling the problem. One suggested, then the other echoed; one added, then the other refined. It could be argued that throughout the discussion, members collaborated to extend and refine one another's ideas as they shared information, integrating opinions,

clarified conceptions, and raised new perspectives. This was "collaborative inquiry" (Lindfors, 1999, p.157), in which cumulative reasoning of members had led to problem reformulating and solutions emerging.

(ii) *Groups should have a communication focus on problem solving*

Group members must recognize that a problem exists and are motivated to solve it. They need to be aroused to a level of motivation sufficient to sustain decision making efforts, and keeping them close to the problem. The more members are immersed in and focused on the problem, the greater is the likelihood they will achieve a better insight for solving the problem and reaching a decision. High motivation in solving a problem tends to increase members' allegiance to the group and commitment to seeing decision to fruition (Johnson and Johnson, 2009).

Excerpt 5-3-2 served as an example in demonstrating members having a strong focus and high motivation on tackling a problem.

Discussion Excerpt 5-3-2 *(Group C: Discussing on how to handle a topic)*

Yin :	About the uniform article, I plan to write on three discipline teams: the Air Auxiliary Force, Hong Kong Immigration, and the Fire Service.	*—Presenting idea to seek group consensus*
Ting :	Hong Kong Immigration?	*—requiring confirmation*
Yin :	Yes, Hong Kong Immigration.	
Shing :	How much data have you collected?	*—making sure idea is feasible*
Suen :	Did you search from the web?	*—making sure data is available*
Yin :	Yes.	
Ting :	Has the web contained all the required information?	*—making sure data is adequate*
Yin :	Yes, it is.	
Shing :	Is it adequate? Don't tell me there is only one in it.	*—evaluating feasibility of idea*
Yin :	A bit scarce. The data is presented in relation to the ranks of the officials.	
Shing :	Are the photos matching our needs? Are they consistent with the topics?	*—evaluating feasibility of idea*
Yin :	Most of the photos are on caps and badges.	
Ting :	That means different ranks will have different caps and Different badges!	*—inferring knowledge*
Yin :	Yes, if rank changes then caps and badges will change.	

Ting :	Why don't we handle it in the opposite direction?	*—provoking members to think from another angle*
Yi :	Yes, we can focus on the badges. Through describing the badges then introducing the ranks of the officials !	*—generating new idea and making conclusion*

The above episode could possibly serve as an example to show collaborative dialogues taking place in a group for solving problems and creating solutions. The dialogues were in the sequence of this:

- present idea ⇨ seek confirmation ⇨ make sure idea feasible ⇨ evaluating idea ⇨ infer knowledge ⇨ provoke thinking from another angle ⇨ generate new idea and make conclusion

The new idea and conclusion proclaimed by *Yi* at the end was not by individual's effort, but was arrived at by going through the process of questioning, refining, evaluating and explaining. It was the collective thinking and collaborative dialogues contributed by all members in the group. The collaborative dialogues in the above episode could be interpreted as members being motivated to solve the problem and eager to arrive at a conclusion. The active participation and prompt responses in discussion had led to arriving at a decision.

(iii) ***Groups should have a critical evaluation of information and alternatives***

In order to make better decisions, groups have to pull different alternatives and several courses of action together. The alternatives should be evaluated so that the most promising one will be identified. In approaching a problem or decision, individual members have an initial conclusion based on current knowledge, perspective, dominant response, expectations and past experiences (Forsyth, 2010).

The following episode demonstrated the process in which information and alternatives were evaluated in order to come to a conclusion in discussion.

Discussion Excerpt 5-3-3 *(Group A: Discussing about the substance of articles)*

Wan :	Perhaps we can look for one advertisement which has different ways of presentation in different eras. Then we can make comparison on them.	—*Presenting idea to get group consensus*
Hei :	The "Mark Six" can be one of those!	—*Supporting idea by providing example*
Wan :	This advertisement is across eras!	— *further reinforcing own idea by providing a justification*
Yuet :	I think it is better focusing on the local examples. As our magazine talks about local culture, there is no reason for us to use advertisements from Mainland China or overseas countries.	—*Evaluating members' suggestion by reminding them of the direction of magazine*
.....		
Ho :	What about the advertisements of the Hong Kong Family Planning Association?	—*Proposing another alternative*
Wan :	It is too boring! This advertisement has been covered By many magazines already.	—*Evaluating the alternative*
Ho :	What about the one on "Nestle Milk"?	—*Proposing another alternative*
Hei :	"Yaculty" is another classic advertisement too!	—*Further proposing another alternative*

The above episode could be considered as an example demonstrating the process of arriving at a decision by evaluating each others' ideas. The dialogues were in the sequence of this:

- Present idea ⇨ support idea by supplementing examples ⇨ reinforce idea by providing justification ⇨ evaluating the idea ⇨ propose an alternative ⇨ evaluate the alternative ⇨ propose another alternative ⇨ further propose another alternative

In the dialogue series, different alternatives were being evoked, and evaluations on them were also made. Members' responses were dynamic and instant. They took individual's views seriously through the discourses of supporting, reinforcing, and evaluating. Views were not let go and unattended. This was also an example of collaborative inquiry. The group ultimately had come to a decision of targeting at writing a feature on classic advertisements, and this was the outcome of the group's collaborative inquiry.

5.3.2 Methods of decision making

There are many ways to make decisions in group discussions, for example, decision by authority and expert member, by averaging members' opinions, by group consensus and so on (c.f. Johnson and Johnson, 2009, p.282-287).

Decision by authority and expert member normally occurs in the groups which have an authority structure and power hierarchy. It is to let the Leader tell the group what the decision is. Decision by averaging individuals' opinions is similar to majority voting, which is to ask each group member his/her opinion and then averaging the results by picking out the most common and popular one. However, these were not the ways the project groups adopting for making decision. They tended to decide by consensus.

Decision by consensus is that every member in the group agrees on the same course of action. To achieve consensus, members must have cumulative reasoning, in which information is shared, issues are clarified, and alternatives are sought. It requires open communication and support from members who understand the decision and are prepared to support it (Johnson and Johnson, 2009).

From the discussion excerpts provided earlier, it could be argued that for the project groups to achieve consensual and synergistic decisions, they would possibly need to reach conditions like those listed below:

(i) Members are able to seek out differences of opinion. In such a way, a solution that can minimize differences and coming to a more convergent consensus will normally be arrived at.

(ii) Members have to present positions and arguments clearly, logically, and as persuasively as possible. It is when justifications and reasons are clear to everyone in the group then a decision can be made.

(iii) Members need to analyze others' views by considering carefully and evaluating critically. Pointing out shortcomings and loopholes of a view is potentially constructive to attain a more desirable decision for the group.

(iv) Members should encourage others to present the best case. When good ideas are presented, members need to support, refine, and add further perspectives onto it. The group as a whole should be keeping the goal in reaching the best decision

(v) Members should not be afraid of conflicts and being challenged. They should be prepared to change their mind when being persuaded.

5.4 Chapter Summary and Conclusion

This chapter has addressed the question of whether cognitive reasoning occurred in the project group discussions, and the discourse forms associated with it. The findings tended to indicate that cognitive reasoning did occur, and the discourse patterns associated with it were: (i) questioning (King, 1991; King et al., 1998); (ii) elaborated explanations (King et al.; 1998; Webb & Favivar, 1994), and (iii) argumentation (Chinn & Anderson, 1998; Chinn et al., 2000).

As pointed out in the literature review chapter, a number of research studies have demonstrated that successful learning groups are usually associated with high-order thinking, interpretative talks, collaborative inquiry, and co-construction of explanations (Chan, 2001, Coleman, 1998; Teasley, 1997; Kuhn et al, 1997; Okada & Simon, 1997). As found in several discussion episodes, the project groups of this study had engaged with explorative questioning, elaborative explanation, problem solving and decision making, in coordinating the diverse views and abilities in addressing address the project task in their collaborative discussions.

5.4.1 Explorative questioning

Analysis of the discussion dialogues suggested that exploratory questioning was one of the major discourse types in collaborative discussions of the project groups under study. Group members were found to have made good use of a variety of forms of questions in seeking confirmation or clarification, demanding justifications or verifications, inferring or confirm knowledge, generating new ideas, and evaluating proposals.

As the discussion episodes indicated, questioning was used to help make clear one's position and thinking. When responding to questions, individual members went through a thinking-aloud process, making ideas be evaluated. Other questioning forms also helped infer knowledge so that misunderstanding and misinterpretation could be avoided.

The evidence from this study tended to suggest that evaluating ideas through questioning was worthy of promotion in enabling group discussion. It helped to alert members to the possible problems, shortcomings and loopholes of an idea, so that it could be refined and a better outcome achieved. In the project groups, questioning to make evaluative comments was a way to avoid causing annoyance. Members were found to be tactfully incorporating a judgment into a closed question, and avoid evaluating another's idea by proposing a new one to replace it. Questioning was also used as a softener when pointing out the inadequacy of a view. It was milder and subtler than using a direct evaluative statement. However, polite evaluation through questioning might also inhibit students to engage in critical discussion as students did not want to confront each other (Veerman et al., 2002).

Responses generated by exploratory questions are regarded as high-level thinking in terms of students' reasoning processes (Nystrand et al., 1997), because it promotes high-order reasoning in triggering members to check each other's information and to provide explanations and justifications (Grasesser & Person, 1994; Webb, 1995). Analysis of the discussion excerpts in this Chapter demonstrated that members used questioning to draw on new information, elicit elaborative explanations, check and verify other members'

ideas (Visschers-Pleijers et al., 2006). Evidences tended to suggest that the project groups had engaged in higher-order questions, which helped elicit explanations, generate insights, and enhance the cause-consequence reasoning (King, 1990; Veerman et al, 2002).

5.4.2 Elaborative explanation

The analysis of the discussion dialogues demonstrated that different forms of elaborative explanation were used by the group members in reorganizing materials, clarifying ideas, recognizing misconceptions, filling in the gaps of members' understanding, connecting ideas, internalizing knowledge, and developing new understanding and perspectives (Webb et al., 2008). Explanation was also a thinking-aloud process in which members' meta-cognitive awareness of what they knew and did not know could be developed (Cooper, 1999).

It was observed that members were able to state their views by providing explanation, reasons, justifications and examples in group discussions. In presenting their views, members were able to rectified self or others' misconceptions. Members in general wwere observed to be able to engage in high-level verbal interchanges such as giving explanations, connecting prior knowledge to new information (Chizhik, 1998).

As the discussion dialogues showed, students were intrigued to provide assistance for one another in finding a common ground on which to build shared understanding (Crook, 1994; Palinscar and Herrenkohl, 2002). This was a form of cumulative reasoning. In some discussion scenes selected for this chapter, it could be seen that when individual members put forward a view, the others would evaluate, add on new perspectives, suggest another angle, reinforce the idea, and refine the proposal. Members tended to extend and refine one another's ideas as they shared information, integrated opinions, clarified conceptions, and raised new perspectives. This was a form of "collaborative inquiry" (Lindfors, 1999, p.157), in which the cumulative reasoning of members had led to problem reformulating and solutions emerging.

It was noticed that in stating one's view, members tended to generate connections, such as connecting to other members' ideas, prior knowledge, teacher's authority, experience of the past students and so on. These connections brought about mutual support, reference, mandate and authority so that an agreed decision could possibly be more easily attained.

5.4.3 Problem solving and decision making

When students interact with the other members in a group, something collective is produced (Wertsch, 1991). At the end of the reasoning accumulation process, a conclusion, solution or direction was attained. The outcome of exploratory questioning and elaborative explanation is the construction of shared meanings, through which divergent ideas and perspectives are built into collaborative knowledge. When students work together and share their thinking through questioning and providing explanations, new understandings will be created (Schwartz, 1999; Chan et al., 1997; Roschelle, 1992; Brown and Palincsar, 1989). As the discussion protocols reflected, the project groups of this study had gone through problem-solving and decision making in co-constructing shared meanings.

One condition necessary for achieving shared-meanings is to have all members working on the same aspect of the problem and sharing cognitive responsibility for making decisions for the task (Palincsar & Herrenkohl, 2002). Johnson and Johnson (2009) also point out that, creative insight for decision making and problem solving will only emerge when there is "availability of diverse information and viewpoints", and "group members' disagreeing and challenging one another's reasoning and perspectives" (Johnson and Johnson, 2009, p.354). The success of reaching decisions requires integrating each others' resource and reconciling each other's views into the group's common goal. The decision making process is the sum of cumulative reasoning and problem solving.

Analysis of this chapter tended to suggest that the project groups were involved in decision making, and members were in general motivated to solve the task problems. As pointed out previously, collaborative dialogues were in the forms of explorative

questioning and elaborative explanation, in which information was shared and members' resources were being utilized. These were the conditions for decisions to be made and problems to be solved. The project groups were more prone to make decisions by consensus, of which members were found to evaluate information and alternatives so that errors and blind spots were corrected, and insights and strategies were to emerge.

5.4.4. Cognitive reasoning in the project groups

Analysis of this chapter had led to an understanding of the happenings in the discussion sessions of a project group with a multiple interactions pattern (c.f. Chapter 4, section 4.4). The Discourse of questioning and explanation helped generate new ideas, provoke thinking and stimulate creativity when members were provoked to think from different angles by other members asking questions. As found, collaborative groups that had cumulative reasoning and with multiple interactions communication pattern would potentially have the following characteristics:

- high degree of involvement of members;
- high communication level and dynamic interaction among members;
- individual viewpoints being attended to and responded to, thus leading to a high degree of reciprocity in interaction;
- engaging in a series of collaborative dialogues, marked by open-ended questions in creating contexts in which the situation clarified, issue evaluated, inferences made;
- members' thinking being provoked, and finally coming up with a solution that could help handle the task;
- cumulative reasoning attained with members build positively but uncritically on the idea of one another

These were regarded as indicators of high-level thinking (Nystrand et al, 1997; Soter et al, 2008), as members had the opportunity to integrate ideas and construct new knowledge through the accumulation of reasoning (Kruger, 1992).

Sawyer and Berson (2004) has identified three aspects on interaction that will contribute to learning in collaborative groups:

(i) Members providing and receiving explanations;
(ii) Members mediating role played by conflict and controversy;
(iii) Members building on each other's ideas to jointly construct a new understanding.

The analysis of questioning, explanation and decision making in this chapter provided the evidence that cognitive reasoning had occurred in the discussions of the project groups. The reasoning process was manifested in the following discourse features:

(i) Questioning triggering different ideas;
(ii) Divergent perspectives being coordinated with information exchange through explanation, elaboration, clarification and connection, and thus leading to the construction of new understandings;
(iii) Problems solved and decisions made as the result of collaborative interactions with the shared knowledge becoming richer.

This chapter had demonstrated that cognitive reasoning did take place in the project groups. The associated discourse forms were: (i) exploratory questioning; (ii) elaborative explanation; and (iii) decision making and problem solving. The outcome of cognitive reasoning was the creating of new understanding, construction of shared knowledge, and arriving at decision making (Puntambekar, 2006). The findings echoed with what was said in the collaborative study literature.

Chapter 6 : Conflict Management in Collaborative Groups

Chapter 5 provided an analysis on the verbal behaviours of students in their project group discussions. It demonstrated that students were mainly engaged with exploratory questioning, elaborative explanation, decision making and problem solving as the forms of cognitive reasoning in the project group discussions. This chapter will continue to look at the dialogue features of group discussion, but from a different angle: argumentations and conflicts occurring in the project group discussions.

Conflict is a natural consequence of group discussions. Johnson and Johnson (2009) held the view that to achieve effective group decision and problem solving, conflicts should be "sought out", "encouraged" and "deliberately constructed", because "effective decision making largely depends on the constructive use of controversy" (Johnson and Johnson, 2009, p.327–349). Cognitive conflict is not necessarily negative as it may elicit transactive dialogues, in which members build on each other's ideas to reach a mutually agreed solution to the task problem (Azmitia & Montgomery, 1993), and resulting in a deeper level of knowledge processing (Visschers-Pleijers et al., 2006). Collaborative argumentation is an important aspect in analyzing group process. This chapter will provide an understanding on the nature of conflicts and the ways of resolving them in the project groups under study.

6.1 Group Conflicts as Reflected in Student Interviews

Source of conflict may come from differences in goal, personality, procedures or miscommunication. According to Forsyth (2010), there are three types of conflict: (i) substantive conflicts; (ii) procedural conflicts; (iii) and personal conflicts (c.f. Table 3.7, Chapter 3); and according to Ruble and Thomas (1976), group conflicts can be resolved by five styles (c.f. Table 3.8, Chapter 3).

The majority of the members in the project groups said in the interview that they did not

recall any serious conflicts occurring in their groups. However, as seen from members' written personal reflections, minor group disputes had occurred. Members arguing on the project task were actually found in a few scenes. The disputes were not serious, and could ultimately be resolved by one of the ways suggested by Ruble and Thomas (1976). Based on what individual members said in the interviews, Table 6.1 has summarized the situations where there were disputes and the ways of resolving them in the project groups.

Table 6.1: Types of conflicting situations and ways of resolving in the project groups
(Summarized from the data of student interviews)

Project group	Member	Conflicting situations	Types of conflicts	Ways of resolving
Group A	*Yuet*	Different views on how to handle the articles	***Substantive***	***Problem solving*** (by finding a solution to it)
	Hei	Divergent views on the page design	***Substantive***	***Problem solving*** (by discussion, and see which view more acceptable)
	Ho	Different views on how to handle the project task	***Substantive***	***Compromising*** (by giving in) ***Avoidance*** (by letting the time go)
	Wan	Different views on how to structure the final oral presentation	***Substantive***	***Avoidance*** (by pretending nothing had happened)
Group B	*Ma*	Divergent views on meeting schedules, submission deadlines etc	***Procedural***	***Avoidance*** (by sending apology, pretending nothing had happened)
	Suet	Related to individual's emotions that made others feel offended	***Personal***	***Avoidance*** (by showing under-standing, sending apology, treating to lunch)
	Yan	Related to workload distribution and submission deadlines	***Procedural***	***Avoidance*** (by telling jokes to release group tension)
	Ying	Most arguments were between Ma and Suet	***Substantive***	***Problem solving*** (by making negotiation)
	Yuen	Related to workload distribution	***Procedural***	***Compromising*** (by the minority giving in)
	Yi	Different views on how to handle the project task	***Substantive***	***Compromising*** (by arbitration)
	Shing	Different views on how to	***Substantive***	***Compromising*** (by giving in)

Group C		handle the project task		***Problem Solving*** (by finding out ways to make remedy) ***Avoidance*** (by sending apology)
	Ting	Different views on how to handle the project task	***Substantive***	***Compromising*** (by giving in)
	Yin	Different views on the page design	***Substantive***	***Avoidance*** (by sending apology, soothing with empathy)
	Suen	[*Not aware of any conflicts in the group*]	N/A	N/A

The data of student interview indicated that the project groups had experienced all three types of conflicts: *substantive*, *procedural* and *personal*. The majority of the conflicts stemmed from substantive issues on how to handle the work and improve the quality of the project task, which were resolved by the strategies of *problem solving, compromising,* and *avoidance*. In using the *problem solving* strategy, members tried to find out solutions, better ways and remedies through discussions, negotiations and arbitrations. The *compromising* strategy usually meant individual members giving up their own positions and views. In some cases, members would simply pretend that nothing had happened by using the *avoidance* strategy.

There were a few procedural conflicts occurring in Group B only. The conflicts were more on workload distribution and time scheduling. The group tended to resolve by the strategies of *avoidance* and *compromising*, in the forms of making apologies, telling jokes, giving in, pretending nothing had happened and so on. As students recalled, personal conflicts rarely happened in the groups.

6.2 Nature of Conflicts as Reflected in Group Discussions

6.2.1 Substantive conflicts

Substantive conflicts are disagreements about issues related to the group's goals and task outcomes. They occur when ideas, opinions, interpretations and values clash. As observed from the verbal data of group discussions, substantive conflicts were largely

caused by different views on page layout, article titles, column headings, writing quality, structuring of articles and so on. These were issues related to quality improvement of their project work. The project groups had encountered more substantive disagreements than procedural and personal ones, possibly reflecting that clashes of ideas, opinions and interpretations were more predominant in the groups.

Excerpt 6-2-1 is an example demonstrating a substantive disagreement occurring in one of the project groups.

Discussion Excerpt 6-2-1 *(Group C: Discussing on whether to delete an article)*

Shing :	Are we going to keep the article on the Museum of Hong Kong Correctional Services? One possibility is to abandon it.	—*Suggesting to delete the article*
Yin :	I think it should be retained. It fits into the direction of our magazine, and it makes our magazine look more substantial.	—*Disagreeing with deleting the article*
Shing :	If we are working on so many topics, it will make our page layout and design work very late.	—*Insisting on deleting the article*
Suen :	I can move up the schedule of interview. I have done half the work already.	—*Trying to solve the problem by giving in what she had*

In the above episode, *Shing* and *Yin* were arguing whether an article should be retained or removed. The disagreement was substantive an it was related to the betterment of the magazine quality. Both *Shing* and *Yin* provided the reasons for their own position. To resolve the conflicting views, another member *Suen* was willing to give up part of her article space so that the article in question could be retained. The disagreement was settled without too much rigorous debates. It was resolved by a member giving in her position.

Substantive conflicts are not necessarily negative. Groups can use the conflicting situations to trigger critical thinking, develop plans, increase creativity, solve problem, and resolve grounding conflicts of viewpoint (Forsyth, 2010; McGrath, 1984). *Ma*, the Leader of Group B had expressed a similar view in her personal reflection:

"Disputes and disagreements had affected our work progress, but they also brought about new ideas and innovative thoughts, making our work smoother than before."
(*Ma*, Group B, in personal reflection)

6.2.2 Procedural conflicts

A few procedural conflicts were identified in the project groups. These were disagreements on the meeting time, working schedules, workload distribution etc. The arguments were related to better work arrangement and work schedule. Procedural conflicts usually centered round technical issues and were relatively easier to solve. Groups could minimize procedural ambiguities by setting up rules and procedure statements that could specify decisional processes and responsibilities in resolving procedural conflicts.

Excerpt 6-2-2 demonstrates the occurrence of a procedural conflict in one of the project groups.

Discussion Excerpt 6-2-2 *(Group B: Discussing how to make arrangement for interview)*

Ma :	So when are we going to do this interview? Let's fix a date for that, OK?	*—Inviting views on fixing the interview date*
Yan :	On weekdays.	*—Making suggestion*
Yuen :	No need to hurry. We can send him the interview questions first and then fix the date.	*—Disagreeing with Yan*
Ma :	But we haven't set the questions yet.	*—Disagreeing with Yuen*
Ying :	Yes, the questions are not ready.	*—echoing with Ma*

In the above episode, *Yan*, *Yuen* and *Ma* had different views on the date and the way to handle the interview. This was a procedural conflict caused by procedural ambiguities. Disagreement on technical issues like this could possibly be minimized by setting up rules and procedure statements that specify goals, decisional processes, responsibilities, and to regulate discussions (Ruble and Thomas, 1976), such as who should make the final

decision, when to send out the interview questions, and which steps need to be taken in making appointment with the interviewees.

6.2.3 Personal conflicts

Personal conflicts sometimes are rooted in power struggles and antipathies for other members. Disaffection will also increase conflicts among members. As reflected from the data of student interview and personal reflections, the Leader seemed to be the source of personal conflicts in the groups. For example the Leader of Group B (*Ma*), was not quite welcome by the members due to her autocratic leadership style. The Co-leader of Group C (*Yi*) was dissatisfied by members as she gave hard comments on members' work. *Yuen* (Group B) commented to the Leader in her personal reflection as follow:

> "She thought she was always right, and refused to give in her position. I was used to keeping my mouth shut, but I would argue if I wanted her to know that I need respect."
> (*Yuen*, Group B, in personal reflection)

In the interview, *Suen* (Group C) expressed her less positive feeling on the Leader's behaviour as follow:

> "(The Leader) is too self-centred, too eager to protruding herself out, too manipulative, too prone to ban members' ideas." (*Suen*, Group C, in interview)

Personal conflicts do not have reference to important task issues. Criticism can generate conflicts as people usually dislike others who evaluate them negatively (Ilgen et al., 1981). In some cases conflicts arise due to negative personal qualities, such as moodiness, compulsivity, incompetence, communication difficulties, and sloppiness (Kelley, 1979).

In this study, traits of personal conflicts could be identified from the data of student interview and reflective writings. As the discussion protocols showed, there was no evidence of personal conflicts occurring in the group discussion sessions. It may be due to the fact that members had similar personalities (cognitive complexity and temperament), such that less personal conflicts had displayed (Shaw, 1981; Rosenbaum,

1986; Moreland et al., 1996). On the contrary, if the groups had more members with low agreeableness, then more personal conflicts perhaps would have been displayed (Graziano et al., 1996).

6.3 Disagreements and Argumentations in Group Discussions

The conflicts in the project groups were minor and were largely of the substantive and procedural nature, mainly manifested in three forms: (i) directly evaluating and making comments on others' view; (ii) expressing disagreement by providing contradictory proposals; (iii) making negative judgments and challenging each others' ideas.

6.3.1 Disagreeing by directly evaluating on others' view

The discussion protocols indicated that it was rather common for members to comment on others' views by evaluating the pros and cons, advantages and disadvantages, effectiveness and inadequacies and so on. Evaluation was not necessarily destructive but could let the idea be further clarified, refined and concretized. Evaluation could also lead to the emergence of new ideas. Excerpt 6-3-1 is potentially an evidence of this.

Discussion Excerpt 6-3-1 *(Group A: Discussing about the substance of articles)*

Wan :	Perhaps we can look for one advertisement which has different ways of presentation in different eras. Then we can make comparison on them.	*—Initiating idea*
Hei :	The "Mark Six" can be one of those!	*—being enlightened*
Wan :	This advertisement is across eras!	*—being supported, further adding on justification to support view*
Yuet :	I think it is better focusing on the local examples. As our magazine talks about local culture, there is no reason for us to use advertisements from Mainland China or overseas countries.	*—Evaluating idea by making reference to the direction of magazine*
.....		
Ho :	What about the advertisements of the Hong Kong Family Planning Association?	*—Refining Wan's idea by suggesting a new example*

Wan :	It is too boring! This advertisement has been covered by many magazines already.	—*Evaluating Ho's idea*
Ho :	What about the one on "Nestle Milk"?	—*Accepting evaluation and revising view*
Hei :	"Yaculty" is another classic advertisement too!	—*Accepting evaluation and adding on new idea*

The evaluative comments like those made by *Yuet*: "*I think it is better focusing on the local examples*", and by *Wan*: "*This advertisement has been covered by many magazines already*", could be argued to have been constructive and useful in alerting the group to the possible loopholes in the proposal.

Yuet's comment was related to the direction and positioning of the magazine, which was made from a macro perspective. Her evaluation served as the turning point for *Ho* and *Hei* in coming up with some new ideas of adopting "*Nestle Milk*" and "*Yaculty*" as a focus of the advertisement article.

The discussion chain in the above episode potentially provided an example to demonstrate that evaluative comments were non-harmful but might be a tool for fostering reflection, idea refinement, and emergence of creative ideas (Veerman et al, 2002). The adoption of "*Nestle Milk*" and "*Yaculty*" as the solution to the writing focus was a result of the evaluative comments in the discussion.

6.3.2 Expressing disagreement by providing contradictory proposals

One way to express disagreement is to negate by pinpointing the contradictions embedded in the view, and providing a different or opposite suggestion to replace it. Expressing disagreement by providing a contradictory proposal might make the others feel uncomfortable. However, it could be also argued that the contradictory proposal might be constructive in getting better ideas and desirable conclusions. Excerpt 6-3-2 can potentially be an example of this:

Discussion Excerpt 6-3-2 *(Group C: discussing the topic for an article)*

Yi :	I have a friend whose brother works as the Customs Officer. Do we want to write a feature on this?	*—initiating idea*
Yin :	What kind of information shall we have if we really want to write an article on the Customs Officer?	*—responding to the idea*
Suen :	Customs Officer? I think the work security guard sounds more interesting.	*—negating idea and proposing another topic*
.....		
Yin :	We can make a whole-day on-site observation to watch the daily routine of the security guards. It may provide some interesting perspectives for the article.	*—accepting negation and further refining Suen's ideas*

In the above episode, *Suen* disagreed with *Yi* on choosing the Customs Officer as the topic for the article. But she did not express her disagreement directly. Instead, she tried to suggest a new topic as replacement. *Suen's* negation stimulated *Yin* to further refine the idea. The disagreement in the above example could be argued to be constructive for it helped to stimulate thinking in the group.

Disagreeing by providing a counter proposal could potentially make the negation sound more reasonable and acceptable. In the following example (Excerpt 6-3-3), *Yin* disagreed with *Shing*'s idea, and she tried to put forward a counter proposal which was concretized with elaborated explanation.

Discussion Excerpt 6-3-3 *(Group C: Discussing pages allocated to articles)*

Shing :	I am afraid the article on museums is not worthy of two pages.	*—proposing a view*
Yin :	No, I suggest we can send one member to make an initial site visit. Take photos back, and we can make judgment on whether the article is worthy or not. If not, then abandon it. After all, it won't use much Of our resource.	*—disagreeing and putting forward counter arguments*

In the above episode, *Shing* did not provide the reasons for why the article was "*not worthy of two pages*". *Yin* seemingly did not agree. She proposed to make a site visit before making judgment on whether the article was "*worthy of two pages*" or not. The proposal was concrete and led to her disagreement sounding more reasonable and acceptable.

6.3.3 Disagreeing by making negative judgments and challenging others' ideas

It can be argued that making negation judgments and challenging others' ideas is a negative discourse in exhibiting conflicts, because it does not necessarily bring new ideas and may not help in enhancing constructive discussion for the group. As observed from the verbal data of group discussions, there were very few incidents in which members made negative judgments and challenged one another's views. Excerpt 6-3-4 may serve as an example of this:

Discussion Excerpt 6-3-4 *(Group C: Discussing about page allocation for the articles)*

Ting :	24 pages make our magazine look light.	*—Providing a view*
Shing :	28 pages do not make much difference.	*—Evaluating and commenting on the view*
Yi :	Different! Readers can feel the difference!	*—Evaluating and commenting on the view*
Shing :	Using thicker papers will make the magazine look like heavier and more substantial.	*—Disagreeing by proposing a counter argument*
Yi :	*You are so cheap!*	*—Negation judgment by commenting on Shing's personality*

The above example demonstrated a series of disagreement among members. In the final utterance, *Yi* disagreed with *Shing's* suggestion by commenting to him: "*You are so cheap!*" Although *Shing* did not react strongly, there might be the potential risk of damaging the group relationship with this kind of negative judgment on one's personality. In avoiding personal negative judgment may possibly keep better relationships in a group which had lower familiarity level among members

Excerpt 6-3-5 below could be argued as another form of negative judgment made on another member.

Group Discussion 6-3-5 *(Group A: Discussing about how to structure an article)*

Yuet :	If the article is not written well, then it will lead to many disadvantages.	—*expressing her opinion*
Hei :	You are actually saying nothing. A badly written article of course has disadvantages.	—*challenging Yuet's view as empty and unconstructive*

In the above episode, *Hei* could be seen as giving blunt comments to *Yuet*. "*You are actually saying nothing*" might be less offensive then "*it is meaningless*", "*what exactly do you want?*", but was challenging enough in hurting others.

6.4 Ways of Resolving Conflicts in the Project Groups

6.4.1 Resolving by problem solving

In resolving conflicts by the problem solving strategy, members tended to propose counterarguments and creative solutions. This could be argued as positive and constructive as it was cooperative, involving negotiation among members, and less intimidating to inter-members relations. Group tension and negative feeling would be less likely to occur. Resolving by problem solving requires the pulling of resources, seeking out solutions, and interest in negotiation among members in the group (Forsyth, 2010).

In the interview, *Ying* (Group B) pointed out that negotiating and finding out solutions to resolve the divergence were the ways of solving disputes in in her group. *Yuet* and (Group A) and *Shing* (Group C) mentioned that conducting discussions to see which view was more acceptable were strategies used in their groups. These are the problem solving strategy. Below were what these students said:

- "We seldom had arguments. If there were, it was usually the argument between *Ma* and *Suet*. If arguments occurred, we would make negotiations right the way."
  (*Ying*, Group B, in interview)

- "There was not any serious dispute in the group. We would discuss, see whose view more convincing, and then accept that view." (*Hei*, Group A, in interview)

- "*Hei* had different opinions with the others on how the "*Tai-O*" article should be handled. He was very unhappy about it. We tried to find out what the problem was and tried to solve it." (*Yuet*, Group A, in interview)

In the discussion episodes, it was observed that the problem solving strategy was usually in the form of cumulative reasoning that members put forward, refute and argue on the ideas, then us coming to a convergent solution. The following episode (Excerpt 6-4-1) may be an evidence of this process.

Discussion Excerpt 6-4-1 *(Group A: Arguing about sequencing of the articles)*

Wan :	I always have the feeling that topics like *"Do-it-yourself"*, songs and so on should be put at the back. It makes more sense to readers. But now the article on fashion is placed here ...	*—Putting forward her view on how the articles should be sequenced*
Yuet :	The front part of our magazine is focusing on traditional things such as clothes, food, household goods, vehicles and so on. Songs is a different category. But the *"Tai-O"* article is a bit strange. It's new, but also old. In a sense it is also similar to the "Do-it-yourself" as the article aims to call for readers' action - go somewhere or do something.	*—Partially agreeing on Wan's view but not all, then putting forward another idea*
Hei :	That is why I suggest to put the *"Tai-O"* article at the back!	*—Supporting part of Yuet's view*
Wan :	No, the *"Tai-O"* article has got many photos. Should not be put at the back.	*—Objecting to Hei and Yuet's view*
Ho :	In fact I suggest we should not treat the song and music article like what the ordinary magazines do. We are not doing disc review or song review. We actually analyze the lyrics for the sake of demonstrating local cultures of Hong Kong. It is not an attachment, it is a major topic!	*—Resolving disagreement by proposing counter argument and creative solution*

This short episode could be argued as an example of a group which was engaged in the problem solving style to resolve the conflicts, and the divergent views were converged at the end by the emerging of a creative solution (made by *Ho*) as a result of the cumulative reasoning process among members. The divergence was on the way to sequence the articles. It was a substantive conflict as it was relevant to the group's goal and outcomes, occurring when ideas and opinions clashed (Forsyth, 2010). Members all tried to pull out their resources by providing their views in the discussion. There were evaluative comments (made by *Yuet* and *Wan*), supporting sayings (made by *Hei*), opposing words (made by *Wan*), and adding on counter views (made by *Yuet* and *Ho*), which could be considered as a form of cumulative reasoning.

The problem solving strategy was often used to solve the substantive conflicts stemming from differences of ideas and divergent opinions on how the project task quality could be improved.

6.4.2 Resolving by compromising

The compromising strategy involves the giving in positions and demands of some parties in achieving the joint outcomes (Ruble and Thomas, 1976). It is similar to yielding. *Shing*, the Co-leader of Group C, had once given in his position by accepting a member's article, which he considered as not up to the standard. He recorded this conflicting situation in his personal reflection:

> "I have valid reason to say 'no' to her work. … However, insisting on my own view may not do well to the group. After all, I might not be absolutely correct. Letting her work being like that might not affect our project to a great extent. So I gave in my position on requesting her to do the work again."
>
> (*Shing*, Group C, in personal reflection)

At times, members were willing to give in positions because the opponent side used the teacher's words as the authority. This strategy was described in students' reflective writings:

"Originally the groupmates did not accept my article by commenting that it was not up to the expected standard. I disagreed, and we debated on this issue. We then seek the views of the teacher, who mandated my article as good enough for publishing. So they gave in their position. The teacher's words had changed their judgment."

(*Yuen*, Group B, in personal reflection)

There were also incidence where conflicts were resolved by the compromising strategy. The associated discourse was: "*OK!*" "*Alright!*" "*That is it!*" "*Good!*" "*Correct*" "*It doesn't matter*", to indicate the acceptance of an opposite view.

In indicating the giving in of one's own demand and position, members tended to express in the following ways:

- "If no one wants to write the article on the pilot, then, OK, I can take it up!"
  (*Ting*, Group C, in discussion)

- "It doesn't matter. We can do the recording together!
  (*Ting*, Group C, in discussion)

- "Perhaps we can do it this way. I can give in my part, so to let your two articles to do comparison." (*Suen*, Group C, in discussion)

A further example of resolving conflicts by the compromising strategy is provided in Excerpt 6-4-2.

Discussion Excerpt 6-4-2 *(Group A: Arguing about how to solve the problem of inadequate space of putting in the articles)*

Yuet :	Perhaps let me change the direction of my gourmet article to see if it can solve the spacing problem.	—*Willing to make changes to help solving the problem*
Wan :	I can also change my article. Will it help if I just keep one page?	—*Willing to give in request on asking for more pages*
Yuet :	I have got three pages for mine. I can give you one, so that you can have more flexibility in writing your article.	—*Willing to give in one page to help out Wan*

The above episode demonstrated that members gave in their positions to accommodate the need of another member. The excerpt showed an argument on how many pages should be allocated to the articles. Members held different views on this. It ended up with *Yuet* and *Wan* surrendering their pages to make the dispute come to an end. It could be reasonably said that the giving in of *Yuet* and *Wan* was because they wanted the dispute to be solved by retaining a better member relationship. This could be potentially an encouraging way in resolving conflicts in the groups.

The compromising strategy was usually adopted to solve both the substantive and procedural conflicts by the project groups.

6.4.3 Resolving by avoidance

The avoidance strategy allows members to withdraw from a conflict so as to let the other members calm down before proceeding on. Sometimes members withdrew into their shells because they did not know how to handle, or did not have adequate knowledge to deal with the conflicts. As said in the interview, members were prone to adopt the following ways to avoid facing conflicts in their groups:

- Pretending nothing had happened (mentioned by *Wan* of Group A);
- Letting the disputes gone with the time (mentioned by *Ho* of Group A, *Ma* of Group B);
- Showing understanding and sending apology (mentioned by *Ma* and *Suet* of Group B, *Shing* and *Yin* of Group C);
- Telling jokes (mentioned by *Yan* of Group B);
- Treating groupmates for afternoon tea or lunch (mentioned by *Suet* of Group B).

In the interview, *Ho* (Group A) shared his experience on how he avoided conflicts in the group:

"I couldn't recall any conflicting situation in our group. If there were, they were just minor disputes on how to do the work. The disputes will be gone with the time. For me, I usually chose to give in my position. There are different ways to do a work. There is no need to dispute and argue. I tend to agree on what the other members say."

(*Ho*, Group A, in interview)

Utterances in the discussion episodes indicated that the avoidance strategy was used for resolving conflicts in the groups. Table 6.2 has listed some of those examples.

Table 6.2: Examples of utterances on avoiding conflicts

Utterances of avoidance	Avoidance strategy
***Hei*, Group A**: "I am just trying to provide a suggestion. There is no need for you to have such strong reaction!"	Trying to calm down *Yuet* by avoiding touching on the differences of opinions on the design of an article.
***Yuet*, Group A**: "Alas, alright, let's discuss the article sequencing first, then talk about whether to add pages or not."	Avoiding going on with the argument by turning to another issue, allowing for the decision be deferred.
***Ting*, Group C**: "Ask the teacher on how to do that when we meet her tomorrow."	Ignoring the conflict by deferring decision to the teacher at another time.
***Suet*, Group B**: "OK, OK, let's end this discussion!"	Ignoring the conflict by ending the discussion.

The avoidance strategy was often used to resolve substantive, procedural and personal conflicts by the project groups of this study.

6.5 Chapter Summary and Conclusion

6.5.1 Nature of conflicts

The discussion of this chapter has given rise to an understanding of the nature of conflicts and the ways of resolving them in the project groups. It has demonstrated that the project groups had faced conflicts stemming mostly from substantive arguments related to disagreements on how to handle the project task in enhancing its quality and achieving the task in a better way. Procedural conflicts were few and they were mostly related to procedural ambiguities such as time scheduling, workload distribution, and division of labour. Personal conflicts were rare, and they were mainly caused by individual's emotions. Personal conflict caused by personal struggle and power struggle was not found in the data. There was no trait of serious argument being found in the verbal data group discussions. Students did not recall any serious conflicts and disputes occurring in their groups.

Overall, in the project group discussions, conflicts usually occurred as the interaction of inter-dependent people who perceived incompatible goals and interference from one another in achieving those goals (Hocker and Wilmot, 1998). Disputing ideas were manifested through making direct evaluations on others' views, expressing disagreement by providing contradictory proposals, and disagreeing by making negative judgments and challenging another's idea. Making evaluative comments and providing contradictory proposals were potentially more constructive as they contributed to the process of accumulative reasoning and provoked the creation of new ideas for the groups. Making blunt and negative judgment in challenging others' views might affect inter-members relationship, therefore, may possibly have been avoided in group discussions as far as possible.

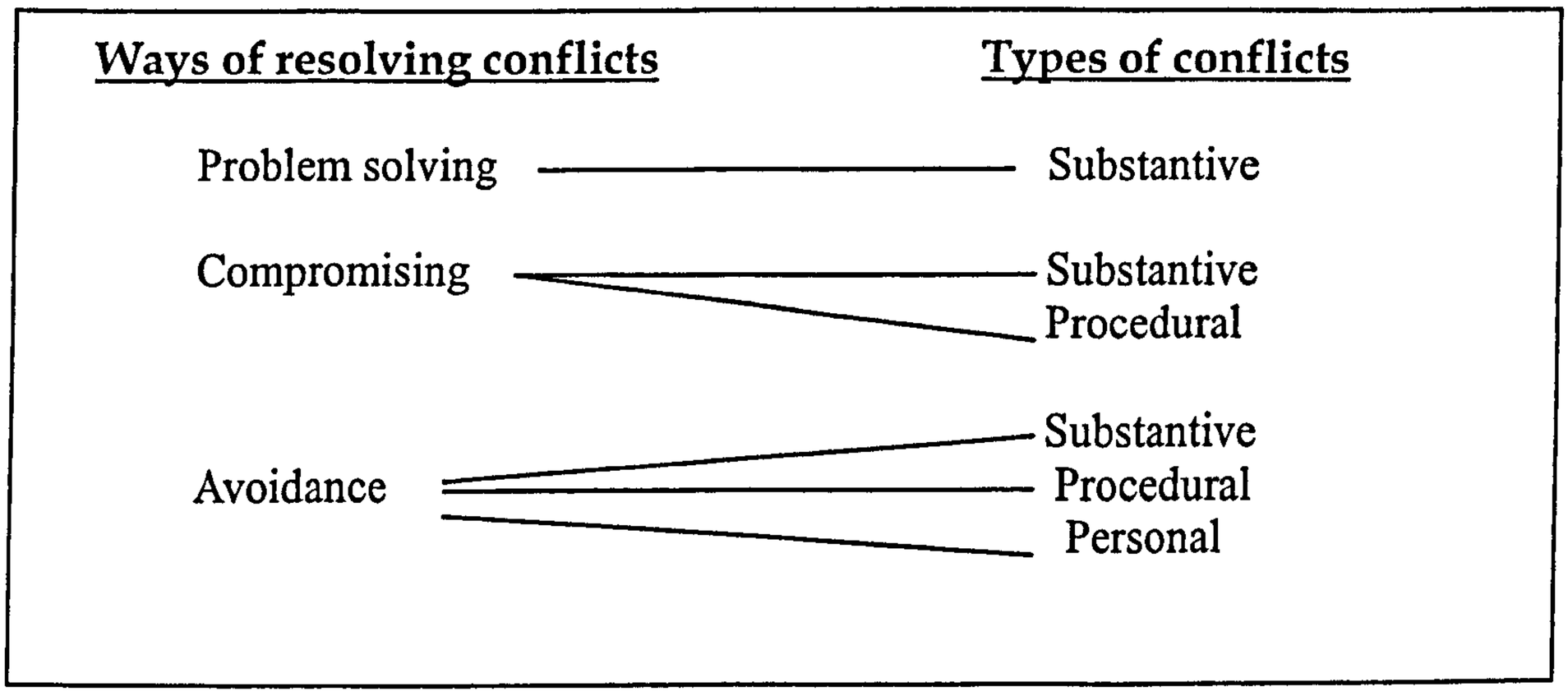
6.5.2 Resolving conflicts

The minor disagreements and divergence of views were able to be solved by a combination of strategies. The problem solving strategy was considered as positive and

constructive as it involved the pulling of resources, seeking out of solutions, negotiation and cumulative reasoning among members (Forsyth, 2010). The compromising strategy was also considered as positive as the giving in and yielding of positions would help in achieving the joint outcomes (ibid). The avoidance strategy was considered as negative as it induced inaction, withdrawal, "wait and see", denial and evasion (ibid), which could provide no help in achieving outcomes for the group, but just deferring the decision to a later stage.

It was discovered that the groups tend to use the problem solving strategy to resolve substantive conflicts, use compromising style to resolve both the substantive and procedural conflicts, and use the avoidance style to solve all three types of conflicts (c.f. Figure 6.1).

Figure 6.1: Types of conflicts and ways of resolving in the project groups



6.5.3 Conflicts are not necessarily negative

Studies have shown that lengthy arguments can be characterized as a complex web of positions, supporting reasons and evidence, and counterarguments against those reasons and evidence (Chinn & Anderson, 1998; Chinn et al., 2000). Argumentation and conflict

is a process where "meaning is re-negotiated and re-constructed" (Jeong, 2006, p.371). The analysis of dialogues in the project group discussions indicated that in exhibiting cognitive argumentation, members would challenge one another's ideas by using counterarguments, reasons and evidence. They worked together to construct and critique arguments (Golanics & Nussbaum, 2008), presenting disagreement, producing contradictory utterances and judgment negation. Hence, disagreements and argumentation can be the direct force in driving critical inquiry among members.

As reflected in student interviews and retrospective writings, conflicts were minimal and disputes were non-serious. There was no trait of members being disturbed by the conflicting views and minor disputes occurring in their groups. They did not think disagreements would have brought about negative effects to the groups. Some of them actually took a positive view on the conflicts occurring in their groups. *Yi's* (Group C) sharing on how she perceived group conflicts might serve as a rounding up to end the analysis of this chapter:

> "Without arguments, discussions could not be triggered, thinking would not be stimulated, and insights would not emerge." (*Yi*, Group C, in interview)

Chapter 7 : Students' Perceptions of Group Experience

It was argued in the previous chapters that members acted in different ways and performed different roles in the project groups. Evidence of cognitive reasoning was exhibited as members were engaging with problem solving, decision making, and construction of shared meanings in group discussions. There were arguments and disagreements existing in the groups, but the conflicts were minimal and non-serious. All these seemed to have suggested that students had gone through a positive group experience in doing their final year project work.

Coming to the final part of the study, this chapter is going to examine how students perceived and experienced this three-month group process. The analysis was based on the data drawn from students' interviews and personal reflective writings. The findings did not indicate significant differences between individual members in general. However, the students' accounts seemed to suggest that there were members who had encountered anxieties and frustrations in the group process. These members were mainly those taking up the leadership role.

7.1 Indication of Positive Group Experience

As students' reflective writings showed, indication of negative feeling and adverse comment regarding project group experience was not common. There were quite a number of statements commending their group experience as worthwhile and memorable. Table 7.1 provides samples of remarks written in students' personal reflections on their group experience.

Table 7.1: Sample of student remarks on their group experience
(extracted from personal reflective writings)

	Member	Remarks
Group A	***Yuet***	"I have been working happily on this group project. It is truly a happy learning experience for me!"
	Hei	"I enjoy the collaborative process. … I am really happy in having completed the project task together with my groupmates."
Group B	***Ting***	"I really like working as a group. It was marvelous when the team worked towards the goal step by step together, striving for the job together, and solving the problems together. It was an impressive and memorable experience for me."
	Yin	"The pleasant collaborative experience with the groupmates will be part of my unforgettable memory."
Group C	***Ying***	"Each member had their own strengths. We contributed our best competencies by complimenting to each other. With this, we accomplished our project task successfully."
	Suet	"The project work has become part of my pleasant and unforgettable memory. I shall ponder it over my life."

Statements provided by the above students may potentially be a piece of evidence showing that they had positive perceptions of their project group experience. The data possibly suggested that these students treasured the group experience in three aspects: (i) they had been working towards a common goal; (ii) they found the collaborative process worthwhile and unforgettable; (iii) they had gains in several aspects from the group process.

7.1.1 Members had been working towards a common goal

In students' reflective writings, it was found that nearly everyone expressed their treasuring of the group togetherness, which, as they said, had fueled them up with energy and drive in working as a team. Students in general were satisfied with the group goals being accomplished step by step. They said they were excited when witnessing the completion of the project, which was the fruit and outcome of their group togetherness.

Some members metaphorically described the project outcome as "*our baby*" (by *Yi*, group C), "*product of our painstaking labor*" (by *Yin*, Group C), and "*the fruit of this three-month's love*" (by *Yuet*, Group A). *Ting* (Group C) described such collaborative experience like this:

> "I really like working with my groupmates as a team. All members were working towards the same goal, step by step, striving hard, solving problems together, this is indeed an impressive memory in my life." (*Ting,* Group C, in personal reflection)

Hei (Group A) was also impressed by the group's joint effort in accomplishing the project task. He said,

> "We cannot rely on one member to accomplish the task of publishing a magazine. We need the whole group's collaboration. … I am lucky to have them as my groupmates… I did enjoy the collaborative process." (*Hei*, Group A, in personal reflection)

7.1.2 Members found the collaborative process worthwhile and unforgettable

"*Unforgettable*" and "*worthwhile*" were two common descriptions used by members in their reflective writings. *Yin* (Group C), for example, wrote that, *"I believe this collaborative experience will be an unforgettable memory in my life."* Similarly, *Suet* (Group B) wrote that, *"It is a lovely and unforgettable time that I shall remember and treasure in the rest of my life."* It was the "group togetherness" that had led to the worthwhile and memorable collaboration experience, as students' reflective writings suggested.

7.1.3 Members had gains in several aspects from the group process

A high proportion of statements in the reflective writings indicated that students had gained something from the collaborative process. For example, *Suen* (Group B) said,

> "My groupmates and I have tried our best. We all have gains from the project work. These gains are far more important than getting high grades for the project."
> (*Suen*, Group B, in personal reflection)

The kinds of gains, as inferred from what students said in the interviews and reflective writings, were as follow:

(i) They gained pride and satisfaction from the collaborative project

The project outcome, which was a 36-page magazine, could not be completed without the joint efforts of group members. Some students expressed their amazement when seeing the product coming out. Some proclaimed that they were proud of their magazine being published in a way similar to that of the commercial ones. Some expressed their high satisfaction on doing this project work. For example:

> "We are proud of what we had done to publish the product!"
> (*Wan*, Group A, in personal reflection)

> "We have successfully published a magazine targeting at the pet lovers. It has high readability. We are really proud of what we have done!."
> (*Yuen*, Group C, in personal reflection)

(ii) They gained friendship from working with one another

Quite a number of students expressed that they found working with one another challenging and rewarding. In closely collaborating with the other group members, they had experienced comradeship and group togetherness, which had built for them a strong foundation of friendship. *Suen* (Group C) used the analogies of "*brotherhood*", and *"fighting to win the war"* to describe the team work in her group. Groups which had encountered problems and ultimately solved by joint efforts would potentially have the friendship and group cohesiveness strengthened.

As Wheelan (2004) pointed out, when a group has navigated through growing pains, a

more mature negotiation process about group goals, structure, roles and division of labor is developed, then trust and structure will be put in place. Like Group A, it once encountered difficulties in arranging an interview with a Chinese tea-house and a famous gourmet, but on solving the problem with group effort, the team became even more cohesive. *Hei* expressed his satisfaction on the group collaboration in his reflective writing:

> "Publishing a magazine can never be a one-person work. It requires cooperation of all members. I am really happy to collaborate with them, and I am also grateful to them. With mutual help from all members of the group, we would not mind how difficult and heavy the work is. I feel very happy in collaborating with my groupmates."
> (*Hei*, Group A, in personal reflection)

(iii) They gained knowledge from working on the project

Apart from friendship, some students indicated that they had also gained hands-on knowledge on the media work, including the interview techniques, article writing and editing strategies, skills in page layout and design, and the operation of desktop publishing software for. For example, *Ma* (Group B) said she had gained the experience of interviewing people from the group project:

> "I am a shy girl and not used to talking to strangers. The project had given me the chance to interview people from different fields. On having interviewed many people on a number of occasions, I have conquered my fear in talking to people. I now have mastered the interview techniques." (*Ma*, Group B, in personal reflection)

Hei (Group A) said that he had acquired a better aesthetic sense on page design and layout from doing the project:

> "I now come to know how pictures and photos can substantiate the contents of the article in making make the article concrete and vivid. … I have also learned how to integrate those technical information into an article, adding in stylistics and rhetoric to make it more interesting for reading. … These are all new knowledge learnt from the project work." (*Hei*, group A, in personal reflection)

(iv) They gained self-realization from working with the other members

In collaborating with others, some students discovered themselves as "*not considerate and sensitive enough to others' needs*" (by *Suet*, Group C), "*too blunt and straight forward in presenting my views*" (by *Yi*, Group B), "*too aloof to listen to others' view*" (by *Suen*, Group B), "*not broad-minded enough to accommodate diversified* views" (by *Shing*, Group B). This made them realize the need to change their attitude and mentality in collaborating with the others. Below are examples of students' sharing on how they had come to self-realization because of the group project:

- "I need to talk less and listen more. From now on I shall think before I speak."
  (*Yuet*, Group A, in interview)

- "I should not be afraid of speaking up in group discussions. I need to be more persistent and be confident in putting forward my views." (*Wan*, Group A, in interview)

- "I need to be more accommodating to other people's needs, and not too self- centred."
  (*Shing*, Group C, in interview)

- "I should not just listen and not speaking up. I have been too cautious and lacking in self-confidence. From now on I shall have more courage in putting forward my views."
  (*Yin*, group C, interview)

7.2 Perceptions on Group Development Stages

All groups change over time. Tuckman (1965, 1977) modeled group development into five stages: (i) the forming stage; (ii) storming stage; (iii) norming stage; (iv) performing stage; (v) adjourning stage. For the project groups of this study, group process was divided into three major stages:

(i) *The project planning and formulation stage:*

Groups to make decision on project direction, goal, structure, contents, and to set up schedules and plans for completing the task.

(ii) *The project execution stage:*

Groups to interview people, making site visits, writing, revising, and editing articles.

(iii) *The project concluding stage:*

Groups to organize articles into a well defined magazine structure, put in design and layout, and make preparation for a oral presentation on their project work.

The interview data suggested that group members tended to have different perceptions and experience in the three project stages.

7.2.1 At the planning and formulation stage

In the interviews, almost all students indicated that they felt perplexed and frustrated at the initial stage of project planning and formulation. Based on what students said in the interview and writings, the factors leading to members' anxiety in this stage could be inferred as follows:

(i) Group goals were not yet developed

The formulation and planning stage was the time when the project groups had to search for orientation and direction. Members had different conceptions of the task goal, project operation, and work plan. Brainstorming in converging different views was needed. Time spending on discussions could be wasted as consensus and conclusion might not be reached in the group. The Leader of Group B, *Ma*, described the situation at the planning and formulation stage as:

> "At the formulation stage, there were so many different views being put forward, and it was difficult to come to a consensus. The discussions seemed to be going round and round. Sometimes we lost patience of dwelling on one point without coming to the conclusion." (*Ma*, Group B, in interview)

Shing, the Co-leader of Group C, described a similar experience:

> "We felt very confused in stage one. Members had different ideas about the what to do for the magazine. We could not find a clear direction on what to proceed on. A lot of time had been wasted on such discussions." (*Shing*, Group B, in interview)

At the initial formulation stage, members were uncertain about their group goals, and there was not a direction for the task. As full resources were not available for application to the group task at this stage, the groups still felt frustrated with whether the goals were accomplishable or not (Wheelan, 2004). *Yuet*, the Leader of Group A, shared this experience in the interview:

> "Stage one was the most difficult. It was difficult to develop a clear project direction. Even if we could identify the goals, we were still not sure whether we could achieve them at the end." (*Yuet*, Group A, in interview)

(ii) The social structure within the group was still forming

Some students expressed that they felt uncertain about their own role in the group at the project formulation and planning stage. They need to search for role equilibrium and task boundaries at this initial stage (Wheelan, 2004). The identity searching process had given rise to tension and anxiety for individual members. The Leader of Group C, *Yi*, said,

> "At first, as a few members did not know each other too well, it appeared that members were quite reserved in discussions. But the situation changed when coming to the project execution stage." (*Yi*, Group C, in interview)

With time gone and ice broken, the tension was dispelled and roles were defined, students said they felt more at ease and secure when going into the project execution stage.

7.2.2 At the project execution stage

Having navigated through the pains of searching for directions, setting goals, and identifying roles, the project groups had become more organized and prepared to get down to the project task at the project execution stage. Communication became more task-oriented (Wheelan, 2004). Differences of opinion still arose, but could be dealt with through constructive discussions and sharing of information (Forsyth, 2010). In general, members reflected that the project execution stage had brought them to a satisfactory group experience. The source of good experience at the project execution stage could be interpreted as follows:

(i) Group efficiency and productivity was identified

The groups had spent the bulk of time in seeking direction and arguing at the project planning stage. When coming into the project execution stage, they could start to work and focus on the project operation. The process of identifying suitable interviewees, researching information, interviewing people, writing and editing articles exhibited concrete work and visible outcomes that gave the groups the taste of progress in their work and experiences of group productivity. There was more task-oriented communication in the groups at this stage (Wheelan, 2004). The efficiency and productivity of work became an energizer for members to work as a team. Some students shared their experience of this stage:

- "As we have developed our plan and group structure, work became smoother than before. I liked this stage, for there were a lot of opportunities for me to interview people." (*Ho*, Group A, in interview)

- "As a clear direction had been set, the work became very efficient at the project execution stage." (*Ma*, Group B, in interview)

- "As we had got a clear direction, we could focus on the operation of the project task. The collaboration was very good at this stage." (*Shing*, Group C, in interview)

(ii) Emerging of the "group togetherness"

The groups had gone into the productivity stage in the project execution stage. The work was done with members' joint efforts. Members habitually shared information and worked with each other, striving at the same direction and a common goal. The "group togetherness" emerged as members integrated their efforts in completing tasks and solving problems arising in the execution stage. As shared in the interviews, students were aware of the emerging of togetherness in their groups, and they saw it as an energizer in giving momentum to the group. *Yuet* (Group A) shared this view:

> "To me, stage two was the best. It was full of fun. We always worked, talked and played together. We had a lot of interview opportunities. I enjoyed the happy time."
>
> (*Yuet*, Group A, in interview)

In the reflective writings, students described a few incidents which they considered as most impressive and memorable in their group life. Those incidents had become an energizer in enhancing cohesiveness and solidarity for the group. Table 7.2 has provided some examples of those important group incidents as quoted in students' reflective writings.

Table 7.2: <u>Incidents enhancing cohesiveness and solidarity for the project groups</u>

(summarized from the illustrations provided in students' reflective writings)

	Incidents	Writings in the personal reflections
Group A	Interviewed a traditional paper work artist	*<u>Ho</u>*: "After the interview, Mr. Yu and us had become good friends. He invited us to his paper workshop to watch him making paper works, and we invited him to dinner and karaoke."
	Travelled to an outlier island to collect information for writing a travel feature	*<u>Wan</u>:* "In visiting Tai O to collect information for writing the article, we combined work and play together. This was our work culture, and I liked this culture."
	Visited a traditional Chinese tea house to	*<u>Hei</u>:* "In collecting information for writing the article, the whole group

	collect information for write a gourmet feature	went to the old tea-house in early morning on several days. Getting up early was not easy, but the experience was so wonderful, and it did enhance the togetherness and solidarity for our group."
Group B	Interviewed and visited the Protecting Animals Association	*Ying:* "There were a few obstacles in arranging the interview. But we had made use of our expertise and knowledge to solve the problems. The success of interviewing Protecting Animals Association with the on-site visit was the outcome of group members' joint effort."
Group C	Interviewed and visited the Hong Kong Government Flying Services	*Ting:* "The most impressive task was interviewing the Hong Kong Government Flying Services. We were told a lot of knowledge about their jobs during the visit. We also had hands-on experience in trying out their equipments and putting on the uniforms. We witnessed all those rescuing planes and facilities. It was an unforgettable experience for our group."

Working together for a task, making preparation for the interview appointment, dividing labor of work, tackling difficulties, and going for site visits, these all contributed to the building up of team spirit, group togetherness, and collective memory.

7.2.3 At the project concluding stage

The project concluding stage was the final phase of the project work. It was towards the completion of the project. This stage was marked by: (i) work pressure due to the time constraints for completion; (ii) high efficiency and strong urge in completing the project task on time; (iii) working as a team on the compilation of articles into a structured magazine.

Almost every student agreed that this was an unforgettable stage. Some of them described the project concluding stage like this:

- "As members had built up the shared understanding, we could work with very high efficiency. We all wanted to work to the best and complete the task on time."
  (*Ma*, Group B, in interview)

- "As the whole group was working together from day to night, we had a strong feeling of 'togetherness'. Although the work was difficult, and had extracted a lot of time and effort, the feeling of working together was wonderful." (*Yan*, Group B, interview)

- "We had strong sense of comradeship. We all wanted to perform to our best. That stage was just like delivering a baby." (*Yi*, Group C, in interview)

- "We had strong solidarity. Our group had reached its best condition of work." (*Shing*, Group C, in interview)

The reasons for members to treasure the group experience of the project concluding stage could be inferred as follows:

(i) Groups had reached their maturity

The sense of togetherness built from the collective memory of important group incidents occurring in the project execution stage had laid a foundation on group solidarity. Having gone through the previous two stages in setting orientation, sorting out norms, developing structures, resolving conflicts, and experiencing productivity, the groups had reached maturity in the project concluding stage. Members at this stage were more endurable and more willing to adjust to any differences of opinion so as to avoid delay in the progress of work. Groups had stronger cohesion and goals had become more definite.

(ii) There was information and expertise sharing

The strong sense of comradeship among members at the project concluding stage was brought about by the sharing of information and expertise among members. When near to project completion, members had to work together from day to night in ensuring project completion. Individual members' capabilities and expertise, such as design techniques, aesthetic sense, computer software applications etc, which other members might not have, were shared and utilized. Effectiveness, efficiency, productivity, and cohesiveness, were all built from there.

As reflected in the interviews and writings, students appeared to be more accommodating to one another, and this helped relieve some of the group tensions and anxieties. At the completion of all project stages, students put down positive comments in their writings as a personal concluding reflection of the whole collaborative process. Table 7.3 has listed some descriptions provided by students in their reflective writings.

Table 7.3: Concluding remarks of students on the project group experience
(extracted from students' reflective writings)

	Group process	Group collaboration
Group A	Impressive. Happy. Proud. Treasurable. Worthwhile. Memorable. With satisfaction.	Cooperative. Accommodating different views. Supporting, helping, and learning from each other
Group B	Smooth. Proud. Happy. Correct choice.	Project completed, but friendship still on. Members contributing different expertise and abilities. Members encouraging each other. Clear division of labor.
Group C	Unforgettable. Unregretful. Smooth. Excited. Happy.	Members are committed with same goal. Members helping each other. Shared understanding and solidarity emerge as the group develops.

The collaborative process that students had experienced could possibly be like what Johnson, Johnson and Smith (2007) described,

> "The more efforts students expend in working together, the more they tend to like each other. The more they like each other, the harder they tend to work. The more individuals work together, the greater tends to be their social competencies, self-esteem, and general psychological health."
>
> (Johnson, Johnson and Smith, 2007, p.21-22)

7.3 Perceptions of the Leaders

Overall, the experience of students regarding their project group processes seemed to be positive. However, due to differences in role functions and nature, there were members who had more complex encounters and perceptions of their experience in the project groups. The Leader was a typical example.

Much literature and many research studies have indicated that the leadership role is fundamental in group processes, and members are usually more satisfied and productive when their groups have leaders (Forsyth, 2010). Groups can effectively operate and function on their own when there is an emergence of leadership behaviours and roles; while groups that do not establish a leader tend to be less effective in their discussions (Chemers, 2000; Cohen, Chang, & Ledford, 1997; Hare & O'Nell, 2000; Bormann, 1990).

In this study, students also had expectations on leadership qualities. Below are some examples regarding what were expected from the Leader by the group members:

- "The Leader has to monitor the discussion flow and stimulate members' creativity. She should be able to interpret, elaborate and exemplify on members' ideas."
  (*Hey*, Group A, in interview)

- "The Leader has to monitor our progress, supervise our work, make good arrangements, have commitment, and be helpful." (*Yan*, Group B, in interview)

- "The Leader needs to have systematic mind, attentive to details, willing to accept members' views, having good memories, and knowing well about what the members are doing."
  (*Ting*, Group C, in interview)

Students in this study tended to expect the Leaders to have both task skills and relationship skills (Lord, 1977; Yukl, 2005; Forsyth, 2010). The Leaders were expected to monitor discussions, stimulate ideas, set goals, plan work schedules, coordinate group work, make decisions, develop relations and enhance group cohesiveness. It seemed that the Leader was expected to be a strong person whom the members could rely on.

As reflected in the Leaders' own writings, they seemed to have encountered frustrations and anxieties in taking up the leadership role for their groups. For example, *Yuet*, Leader of Group A, expressed her regret on her demanding and pressurizing leadership style. She was grateful to members who had tried to accommodate her leadership style as such:

> "I was a demanding leader who was critical and had lots of grumbles about members' work. I am grateful for their acceptance on my style like this."
>
> (*Yuet*, Group A, in personal reflection)

Ma, Leader of Group B felt pressurized in putting efforts to ensure the work quality for her group. She was worried about the work quality being affected if members were given a free-hand on making decisions. She found *Ying's* taking on the role of Harmonizer in telling humorous jokes and making fun a way to release the possible tension created in her group:

> "I was worried for the work quality if I left them a free hand to make decisions while I had to leave my leadership role for a while in preparing the language proficiency test. … I liked *Ying* to tell humorous jokes in group discussions. It really helped releasing tension for the group."
>
> (*Ma*, Group B, in personal reflection)

Yi, Co-leader of Group C, was upset with her careless remarks which resulted in creating a tense relationship with a groupmate. She felt stressed in the situation and said:

> "I was rather task-oriented at that time. I tended to make frank and straight forward remarks on members' work, thinking that they would not mind at all. But her constant hostility to me was not something that I expected. I felt stressed and painful about it."
>
> (*Yi*, Group C, in personal reflection)

Shing, the Co-leader of Group C, had encountered a dilemma between standing firm on his position in maintaining the work quality, and in accommodating members' less satisfactory output of work for retaining good relations:

> "Rationally, I had valid reasons to ban her work. However, as we were working as a team, I should also consider members' feeling. … Eventually I decided to give in my position by accepting her work quality being like that."
>
> (*Shing*, Group C, in personal reflection)

The factors leading to Leaders' anxieties were inferred as follows:

(i) ***The anxieties came from inter-personal communication***

As the Leaders were at the high end of the power hierarchy, they had to be cautious about not hurting members with nasty remarks. As reflected in the students' writings, group conflicts were often caused by misunderstandings and miscommunication. Perceptual misunderstandings in the groups could be complicated. It is suggested in the literature that the leaders' frustration may possibly be lessened if members can communicate their intentions, make explicit references to trust, cooperation, fairness, and build a shared in-group identity (Sell at al., 2004).

(ii) ***The anxieties came from the unclear and unspecified group norms***

Data in students' reflective writings indicated that the Leaders felt frustrated because they had to face the dilemma of banning members' work or views, and hurting each other's relationship. This could possibly be brought about by the unspecified group norms. Specifying norms is complex as norms need to be discussed among members to come up with a set of rules and standards on the quality of work outputs before the project process commences. The common understanding about the expected standard and quality may help in reducing hard feelings towards the Leader when members' is rejected and criticized.

7.4 Chapter Summary and Conclusion

The evidence in student interviews and personal reflective writings could be inferred that the majority of students felt satisfied with their group experience, and in general had positive perceptions on the group process. In the interview and personal writings, most students admitted that:

(i) they had been working towards a common goal as a group.

(ii) they found the collaborative process worthwhile and memorable.

(iii) they gained satisfaction, friendship and knowledge from the group process.

The Leaders might have a slightly different perception of their group processes. It does not mean that Leaders were negative about their group experiences, but as a significant figure and being heavily relied on by members, the Leaders had possibly encountered more frustrations and anxieties than the other ordinary members. The Leaders' frustrations arose mostly from inter-personal communication and the unspecified group norms. Leaders in the student learning groups would probably need some coaching for them to attain better group experiences.

Of the three project operation stages, almost every student found the project formulation stage more frustrating, as group goals were not yet developed and social structure within the group were not formed. They found the project execution stage more satisfying, for group togetherness was built and work productivity was exhibited. There were impressive and memorable incidents happening in this stage to help enhance solidarity and cohesiveness for the groups. Students also welcomed the project concluding stage, for the groups had reached maturity at this stage, and information and expertise were shared to a large extent. A strong sense of togetherness and solidarity could be constructed.

Overall, although sometimes there were ups and downs as the groups grew, at the adjournment of the project work, members expressed positive comments on their group experience, and felt happy with their group collaboration.

Chapter 8 : Conclusion

This study has engaged with three types of data: (i) the face-to-face group work interactions (the group discussion sessions); (ii) students' views (the interview protocols); and (iii) students' feelings and perceptions (personal reflective writings); which were cross-examined, corroborated, and triangulated for providing an in-depth understanding of the collaborative learning experience and processes of the college students in Hong Kong. Four major aspects have been dealt with in this study: (i) role structure and role interdependence among group members; (ii) cognitive reasoning in group discussions manifested in the discourse forms of exploratory questioning, elaborative explanation, problem solving and decision making; (iii) nature of conflicts in the groups and ways of resolving them; and (iv) students' perceptions on the group experience in doing the project. The data converged to answer the following questions:

1. Does role structure impact on the collaborative process of the student project groups? To what extent does the role composition affect group norms, communication patterns and behaviour of members in the project groups?

2. Does high-level cognitive reasoning occur in the student project group discussions, and in what discourse forms?

3. How are conflicts managed in student project groups, and what are the perceptions of individual members on their group experience?

8.1 Affirming with the Collaborative Learning Literature

Findings of this study have affirmed with the literature that role structure and role interdependence are salient to collaborative learning (Slavin et al., 1995; Johnson and Johnson, 2009). The study has demonstrated how members encouraged and facilitated

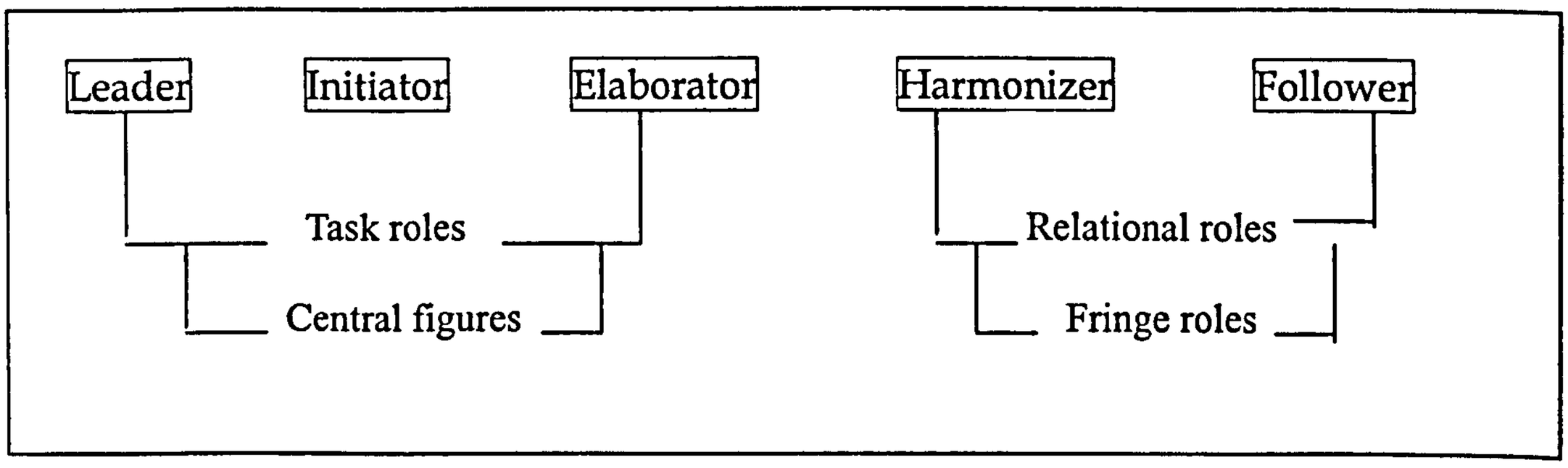
each other to achieve the project goal through mutual help and assistance, exchange of needed resources, effective communication, and constructive management of conflicts (Johnson, Johnson & Smith, 2007). The findings also echo with the literature that in achieving cognitive reasoning, collaborative enquiry, and co-construction of explanations (Coleman, 1998; Kuhn et al, 1997; Okada & Simon, 1997), members have to engage with collaborative dialogues in the form of exploratory questioning, elaborated argumentations, and collaborative argumentation in eliciting information, seeking clarification, making interpretation and providing evaluation (Webb & Favivar, 1994; King, 1991; Kuhn et al, 1997; Nystrand et al, 1997; Okada & Simon, 1997; Teasley, 1997; Chinn & Andersaon, 1998; Coleman, 1998; King et al, 1998; Visschers-Pleijers et al., 2006; Chinn et al, 2000; Chan, 2001).

8.1.1 impact of role structure on collaborative process

Findings of this study further confirmed that role structure and role interdependence will result in the group being a "dynamic whole" (Johnson, Johnson & Smith, 2007, p.16). The findings also suggested that the role and status of members determined individual's level of participation in the collaborative learning groups (Cohen, 1994; Lewis, 1997), and it contributed to the "social equilibrium" of the collaborative learning process (Johnson and Johnson, 2009, p.15).

As discussed in Chapter 4, in initial group formation, some members came with role expectation and some did not. Roles emerged naturally as the group grew and developed. As Benne and Sheats' (1948, 2000) typology suggested, in the project groups under study, five types of roles were identified: Leader, Initiator, Elaborator, Harmonizer and Follower, which could be categorized as: (i) task role and relationship roles; and (ii) central figures or fringe roles (c.f. Figure 8.1).

Figure 8.1 : Role categories in the project groups



In the project groups of this study, there were a higher proportion of members taking on the task roles (or central figures) than relational roles (or fringe roles), demonstrating that "a combination of behaviors, task-and relationship-focused do seem to have an important role in the effectiveness of the groups" (Yamaguchi and Maehr, 2003, p.14). The findings reaffirmed that it was possibly the role equilibrium that had made the project groups survive, because they had met the two basic demands for group survival: the group must accomplish its task, and the relationships among members must be maintained (Benne and Sheats, 1948, 2000).

On the other hand, the findings also added to the literature in suggesting that for a group to be engaged in multiple interactions pattern, it needs to have a higher proportion of members taking on the task roles (or central roles) as Leader, Initiator or Elaborator. This role structure may more likely lead to effective collaborative discussion for the group. Evidence from this study tended to suggest that groups engaged with multiple interactions pattern were characterized by:

(i) The groups tend to elicit more discourse on clarifying, questioning, explaining and adding on new perspectives among members;

(ii) The interaction level and reciprocal rate among members was high;

(iii) Dialogues in discussions were governed by cooperation, evolving continuously and invoking response from another member;

(iv) On the whole, there was higher degree of involvement and more equal participation among members.

Based on this, I would put forward an argument that desirable group structure and better group experience is more likely to occur with the following conditions:

(i) There are more members taking on the task roles (or central roles) than relational roles (or fringe roles) in the group.
(ii) The group has a clear task focus.
(iii) The group is engaged in the multiple interactions pattern that members have equal participation and high degree of involvement in group discussions.

With this argument, therefore, I would suggest that members in a collaborative group can be encouraged to refrain from taking on the fringe roles as far as possible.

8.1.2 High-level cognitive reasoning occurred in group discussions

Evidence provided in Chapter 5 could be argued that cognitive discussions had taken place in the project groups of this study. The discourse forms associated with cognitive reasoning were identified as:

- Questioning in triggering different ideas;
- Divergent perspectives being discussed with the flow and use of information through explanation, elaboration, clarification and connection, which led to the construction of new understandings;
- Problems solved and decisions made as the result of collaborative interactions with the shared knowledge becoming richer.

Analysis of the discussion dialogues demonstrated that mutual exploration and meaning-making among members helped to build new understandings, construction of shared knowledge, and arriving at decision making (Puntambekar, 2006). Group members had worked as a team in mutually searching for understandings and solutions for the project task through the following discourse forms:

(i) Exploratory questioning

Exploratory questioning was commonly used in group discussions. It could be considered as a form of high-level reasoning discourse in triggering members to explain and give justifications (Nystrand et al, 1997; Webb, 1995), as it was found to be used by group members in achieving a number of cognitive purposes in peer discussions, such as:

- For seeking confirmation and clarification on a view that is vague and unclear;
- For demanding justifications and verifications on a view that is not quite agreed;
- For inferring and confirming knowledge to ensure interpretation on a view is accurate;
- For generating new ideas by triggering members' thinking;
- For evaluating ideas by pointing out loopholes and shortcomings, incorporating a judgment, alerting the lack of a perspective, and proposing a new one.

(ii) Elaborative explanation

Elaborative explanation was also commonly used by members in group discussions. As identified from the dialogue data, elaborative explanation was mainly manifested in the following forms:

- providing explanation, reasons, justifications and examples;
- adding on new perspectives to an idea;
- building and refining on one another's views;

- generating connections with other members' ideas, prior knowledge, personal experience, and sayings of the teacher;

Elaborative explanation seemed to be the basis for accumulation of reasoning in constructing shared meanings, giving explanations, and connecting prior knowledge to new information among members in the group (Chizhik, 1998). It was potentially an effective way in reaching mutual understanding and shared meaning, so that a better conclusion could be arrived at.

(iii) Problem solving and decision making

Evidence in the discussion dialogues demonstrated that the project groups were motivated and had focused on a task problem in coming up with conclusions. In the process of problem solving, information, ideas, experiences and resources were shared and utilized; different alternatives and course of action were proposed and evaluated; errors, loopholes and blind spots were rectified; and crucial insights arose. In decision-making, the groups tended to minimize differences of views and coming to a more convergent consensus rather than by authority or by vote. It could be inferred that problem solving and decision making was brought about by the following group behaviours (Palincsar & Herrenkohl, 2002):

- thinking being distributed among members;
- members working on the same aspect of the problem and sharing cognitive responsibility for making decisions for the project task;
- members trying to integrate each others' resource;
- members reconciled each other's views into the group's common goal.

8.1.3 Conflict management in the student groups

Data from all protocols – interview, retrospective reflection and discussion sessions, did not indicate serious conflicts occurring in the groups (c.f. Chapter 6 and 7). There were

minor disputes on job execution, work quality, and so on, the so-called "substantive disagreements". There were a few divergent views regarding time scheduling, workload distribution and so on, the so-called "procedural disagreements". The disputed ideas were mostly manifested through making direct evaluations, providing contradictory proposals, making negative judgments, and challenging on others' idea. The minor conflicts and disagreements were resolved by a combination of styles as follow (c.f. Figure 6.1 in Chapter 6):

- use problem solving strategy to resolve substantive conflicts;
- use compromising strategy to solve substantive and procedural conflicts;
- use avoidance strategy to solve substantive, procedural and personal conflicts.

The problem solving strategy is said to be more positive and constructive for it involves the pulling of resources, seeking out of solutions, negotiation and cumulative reasoning among members (Forsyth, 2010). In this study, there were scenes where the project groups were able to resolve divergent views by using the problem solving strategy, through which members' thinking was provoked and new perspectives were added.

However, the problem solving strategy was actually less used than the compromising strategy and the avoidance strategy. Sometimes members relinquished their positions in order to compromise and allow shared outcomes. But very often, they would rather avoid handling the disputes. The avoidance strategy is seen as negative as it induces inaction, withdrawal, "wait and see", denial and evasion (Johnson and Johnson, 2010), which provides little help in achieving outcomes for the group, but just defers the decision to a later stage.

Prone to using the compromising and avoidance strategy in resolving divergent views may indicate that Hong Kong students tend to get away from direct confrontations, or do not know how to handle disputes, or do not want to spend time disputing and arguing rather than working to achieve the group goal. This may be explained by the cultural factors of collectivism and harmony being seen as important when working with other

people in the Chinese society.

8.1.4 Students' perception of the group experience

As reflected in students' interviews and personal writings, there was no trait of them being disturbed by the minor disputes and divergent views in their groups. They did not think disagreements would have brought about negative effects to their group experience. Most of them found the collaborative process worthwhile and memorable. Working together towards a common goal, and at the end gaining pride, satisfaction, friendship, practical knowledge and self-realization was something that the members treasured.

Students reported that their anxiety level was higher at the initial project formulation stage as the group goals were not yet developed, and the social structure within the group was still forming. They had better group experience at the project execution stage as the group efficiency and productivity was identified, and the "group togetherness" started to emerge. The project concluding stage was the most memorable, because there was rigorous sharing of information and expertise among members, and the group had reached its maturity at this stage.

As represented in students' writings and interview (c.f. Chapter 7), members were overall positive of their group experience. The groups were not merely dividing tasks among members, but had gone through a genuine collaborative learning experience by engaging in the "coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of the problem" (Roschelle and Teasley, 1995, p.70), in a "students' coordinated activity to solve problems" (Chan, 2001, p.443). The groups had showed a high task involvement, manifesting itself in a high number of productive, learning orientated interactions. Members also had a positive perception of their group experience, and considering the collaborative process to be treasured and memorable.

The Leaders might have more complex perceptions of their group processes. As a

significant figure and being heavily relied on by members, they had encountered frustrations and anxieties, which could be reduced if some coaching could be provided for them.

8.2 Extending Beyond the Literature

8.2.1 Extending the understanding of collaborative learning process

This study has affirmed what the literature said, but also extended the understanding of collaborative learning into a few aspects.

(i) Role structure affects group norms and group communication patterns

There is a large body of literature talking about role functions and differentiations in learning groups, but findings of this study have extended the understanding that role structure and status of members will determine an individual's level of participation and contributed to the "social equilibrium" of the collaborative learning groups. The merit of this study is making the proposal that if there are more members taking on the task roles (or central roles) than relational roles (or fringe roles), then better group norms and group experience are more likely to occur. Groups with a higher proportion of task roles will more likely lead to multiple interaction patterns in group discussions.

(ii) Verbal interaction patterns and discourse forms exhibited in the cognitive reasoning process

Past studies on collaborative learning were more on structured and on-line communication. But this study focused on the face-to-face discussion dialogues. It provided evidence for how the sequence of human dialogues reached cognitive reasoning,

how discrepant ideas were confronted, explanation and clarification were given, justifications were provided, problems were solved, and decisions were made in student learning groups, so that an in-depth understanding of the collaborative learning processes can be obtained.

(iii) Conflicts and disagreement were not necessarily threatening

Much literature on collaborative study emphasizes that conflict and cognitive argumentation is an important force in driving critical inquiry for collaborative learning groups, because "effective decision making largely depends on the constructive use of controversy" (Johnson and Johnson, 2009, p.349). To arrive at a shared conclusion, it was said that collaborative argumentation in providing counterarguments against those reasons and evidence was a necessary process (Chinn & Anderson, 1998; Chinn et al., 2000).

Added onto these views, this study has identified several conditions for the project groups to solve problems and make decisions:

- Members need to seek out differences of opinion, so that a solution in minimizing differences and coming to a more convergent consensus could be arrived at.
- Members need to present positions and arguments clearly, logically, and as persuasively as possible. It was when justifications and reasons were clear to everyone in the group then a decision could be made.
- Members need to analyze others' views by considering carefully and evaluating critically. Pointing out shortcomings and loopholes of a view was potentially constructive to attain a more desirable decision for the group.
- Members should encourage others to present the best case. When good ideas are presented, members need to support it, refine it and add further perspectives on it. The group as a whole should be keeping the goal in reaching the best decision

- Members should not be afraid of conflicts and being challenged. They should be prepared to change their mind when being persuaded.

(iv) Cultural dimensions were identified for collaborative learning

The collaborative learning literature, which largely emanates from the western context, may not be directly applied in an uncritical way to the Hong Kong context. The findings of this study suggested that students tend to embrace the group work experience by adopting a conflict-positive group model. This may be related to: (i) authority; (ii) face; (iii) harmony; and (iv) collectivism; which are the four factors influencing Chinese education (Chen, 2006).

Findings also suggested that students had been engaged actively in self-managed group discussions, in which cognitive reasoning in the forms of exploratory questioning, elaborative explanation and so on was exhibited. Seemingly the sayings that Chinese students tend to be restrained in formal or open discussions (Chan et al., 1999), and teachers play an important role in the Chinese educational context (Zhu et al., 2009), do not apply to the project groups of this study. Such cultural complexities perhaps need further research to develop, but the issue of cultural dimensions which is rarely touched on, has been identified in this study.

8.2.2 Providing pedagogical implications for teaching

People generally emphasize content and overlook process dynamics. The findings of this study suggest that students need guidance on how to present arguments and how to use appropriate language that "promotes critical discussion" (Joeng, 2006, p.369). If students can observe their group process and evaluate their behaviour at the end of the group experience, the collaborative learning experience will potentially be even more rewarding.

In Hong Kong, instruction and training on group skills and group processes is not part of the higher education curriculum. Academic staff supervising student project groups may

have little experience in developing and assessing the process of teamwork. They may not have the expertise to provide process consultation support to the groups. "Help manuals" or "survival guides" that provide basic information on "group development, facilitating small groups and common problems in groups" (Lizzio & Wilson, 2006, p.691) may be helpful.

To facilitate students as self-sufficient managers of their group experience rather than directly managing and structure students' group, certain training is useful. Based on the findings of this study, it is suggested that a training package including: (i) arousing awareness of group roles and group dynamics; (ii) handling group conflicts and disagreements; (iii) developing productive collaborative inquiry; can be a use for both college teachers and students.

(i) Arousing awareness of group roles and group dynamics

Group effectiveness is characterized by active participation of group members, shared influence and responsibility for achieving group work, and members' commitment to group goals (Lizzio & Wilson, 2005, 2006). The findings of this study tend to suggest that groups may have better norms if there is role equilibrium. Hence, members can be empowered to take on task roles (central figures) as Elaborator and Initiator, and refrain from taking on the relational roles (fringe figures) as Harmonizer and Follower. This model may more likely lead to multiple interactions pattern for the groups.

For developing group norms and reducing conflicts, it may be advisable for members to discuss and set up ground rules, quality standards and group expectations before the group starts operating. It may help in minimizing conflicts if members know what to expect and what is expected from them. The consented norms and culture may also help to achieve a fair and equitable sharing of workload, active participation, shared influence, supportive and helpful behaviours, shared responsibility, and commitment to group goal among members (Lizzio & Wilson, 2005, 2006).

As student groups may usually have higher anxiety level in the initial formulation stage, early attention to the questions of goals, roles, procedures and working relationships may help build the adaptive capacity of a group. As Lizzio and Wilson (2006) pointed out,

> "Investment in such preparatory strategies may be particularly important in Student learning groups, where 'getting off to a good start' may contribute to earlier task engagement." (Lizzio and Wilson, 2006, p.691)

From the experience of this study, it seems that getting off to a good start may contribute to earlier task engagement for the groups (Lazzio & Wilson, 2006.) by helping them to set direction and find orientation at the project formulation and planning is necessary.

(ii) Handling group conflicts and disagreements

Many people believe that a well-run group is one that has no conflicts among members. A general feeling in the Chinese society is that conflicts are bad and should be avoided. When conflicts occur, members may have anxiety, hence may choose to compromise by yielding in positions, or to avoid disagreeing and challenging the group-mates.

Hong Kong students, like those in the project groups in this study, are potentially afraid of confrontations which they think will destroy friendship or may lead to them becoming an out-group member. The tendency is that some members may hesitate in initiating an idea for fear of it being opposed and knocked down. When divergent views occur, some members may choose to avoid directly facing the conflicting views. It may be due to students not knowing how to present and receive negative comments, or they may see open confrontation as an infringement of cultural values.

The findings of this study provided an understanding that conflicts and disagreements were not necessarily harmful, and so students need not be afraid of group conflicts. Ignorance of how to engage in controversy and lack of training in how to handle conflicts properly may block group members from engaging in controversies. Most students are not trained in making use intellectual conflicts to increase the quality of decision making

and problem solving.

It is suggested that students can be trained so that they know how to take advantage of conflicts when they occur by embracing instead of avoiding them. The findings of this study pointed to the fact that the project groups were more engaged with minor disputes stemming from interactional and logistical tension (Pauli et al. 2008), hence the problem solving strategy (c.f. Ruble and Thomas, 1976) would be desirable for coaching students to handle disputes and deal with divergent views occurring in their groups.

Role simulation can be administered at the start of group formation. Members can be trained in defining the problem, giving explanations, posing questions, adding on perspectives, evaluating ideas, creating solutions and so on. The mindset of being willing to share resources, going for engagement rather than avoidance, and aiming at constructive rather than destructive interaction, is the essence of the coaching here.

(iii) Developing productive collaborative inquiry

The findings of this study showed that in enhancing productive discussions in student learning groups, students' engagement in collaborative argumentation needs to be triggered. It is suggested that students can be made aware of focusing on learning-oriented interactions which are characterized by a wide use of critical and elaborative discourse for group discussion. As far as the experience of this study is concerned, the following discourse forms are found to be useful in triggering collaborative discussion, and can be formalized by systematic training on lock-step discussion management procedures through group simulation activities:

- Using elaboration, verification and justification to clarify views and position;
- Sharing information and utilizing resources of each other;
- Critically scrutinizing and evaluating each other's ideas;
- Asking critical questions and providing counter proposals;

- Using arguments, counterarguments and refutations to resolve conflicting opinions;
- Generating connections among ideas and with prior knowledge;
- Raising new perspectives and incorporating other's responses into own responses.

8.3 Limitations of this study and Future Research Direction

This study had yielded much fruit in understanding the collaborative processes and discourse forms on student learning groups in the college setting of Hong Kong. It was argued that role structure in a student learning group had impact on its collaborative learning. It had identified some forms of high-level cognitive reasoning that occur in group discussions. It had affirmed that students were satisfied and had benefited from the collaborative experience. This study concluded that requiring students to take on group projects could be encouraged as part of the college curriculum. Nonetheless, there are still a few limitations in this study, which can be developed into some future studies.

8.3.1 Future study on the leadership role

The leadership role is fundamental in group processes. Some research findings suggested that groups could effectively operate and function when there was an emergence of leadership, and groups that did not establish a leader were less effective in their discussions (Bormann, 1990; Cohen, Chang, & Ledford, 1997; Chemers, 2000; Hare & O'Nell, 2000;). It is also argued that members are more satisfied and productive when their groups have leaders (Forsyth, 2010).

This study has provided a comprehensive analysis on the role structure and its impacts on group communication pattern and group norms. However, it has not given a close lens on one of the most important role in a group – the Leader. As discussed in Chapter 7, the Leader, being a fundamental role in group processes, had more frustrations and anxieties than the other members. The frustrations were mainly brought about by inter-personal

communication and the unspecified group roles. Although I did not investigate deeper into the leadership management style, I do think issues such as leadership behaviours, leader-member interactions and so on, are important and pertaining to the success of group collaboration. It is not because of negligence that I have overlooked the leadership issue, but in view of the aims and scope of the study which targets at obtaining an understanding and description of the group processes as a whole, the leadership issue is left aside for the time being.

On having launched a grounding study and obtaining an overall understanding of the collaborative learning process, it is worthwhile to extend it and place the focus on the leadership issue. The possible research questions will be:

- Which kind of leadership styles are adopted by the Leaders, expected by group members, and more helpful in enhancing the group goals?
- What are the functions and roles of a Leader in the group in managing and enhancing discussions, organizing group work, and enhancing group relationship?
- How do Leaders interact with members, and in what discourse forms the Leaders use in monitoring discussions and managing group tasks?

To arrive at the answers, a methodology similar to this study can be adopted. Taped group discussions, individual interviews, and students' personal written reflections can still form the data sets for triangulating the findings. With the study of the leadership role, the understanding on collaborative learning experience of the college students in Hong Kong will come to a fuller picture and with thicker descriptions.

8.3.2 Future study on friendship and acquaintance

The other limitation of this study is not touching on the other factors that may affect the collaborative learning process, such as friendship and acquaintance. Friendship and acquaintance is related to the familiarity level, which may have impacts on how group discussions are managed, what discourse forms are used, and whether conflicts occur.

Some research studies suggest that friendship influences the discussion level in group discussions. Friends tend to produce more justifications of suggestions on complex problems than mere acquaintance (Strough et al, 2001; Azmitia et al, 1993). Familiarity level and the formation of learning groups may affect the collaborative outcomes and group experience of students (Wooten & Reed, 2000; Lizzio & Wilson, 2006).

Future research may go into analyzing the discussion discourse to see whether friendship helps to maintain high levels of verbal interaction because of their prior history of collaboration. It may also find out whether it is true that mutual collaboration on complex problems is difficult for individuals who have a lower level of familiarity or not having worked together before. From this, the correlation between members' familiarity level and the quality of their group experience can be compared.

Overall, this study has provided fruitful findings on scaffolding the actual going-on of collaborative process of college student project groups in the Hong Kong context. Based on the evidence from the study, suggestions are made for the necessary conditions for groups to achieve an optimal collaborative learning experience. The ultimate purpose is to inform teaching, so that both teachers and students engaging in collaborative group learning can benefit from it.

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Appendices

Appendix (I): Sample of the interview form

Title of study: Collaborative learning experience in project groups: An analysis of collaborative process and discourse patterns in peer discussions of college students in Hong Kong

Interviewee: _____ Date: _____

Questions:

1. Describe your feelings, views and observations on your project group?

2. How would you describe the characteristics of your project group?

3. Regarding the group process, do you have any unforgettable and impressive incidents to share?

4. What was your experience in different stages of project work, e.g. the planning stage, the execution stage, and the concluding stage?

5. Describe your role in the group. Are you happy with this role? Is this role what you expected?

6. Describe the roles that the other members were playing. How do you feel about their roles in the group?

7. Whom would you consider playing the leadership role? Do you think the leader a key factor to the success of the project work in your group?

8. Was the workload evenly distributed? How was the load divided?

9. Did any disputes or conflicts occur in your group? How often? In what ways were the disputes settled? Had the disputes affected members' cooperation?

10. Overall, what have you learnt from the project group experience? Do you find any changes in yourself after the project work, such as improvement in knowledge, ability, attitude, working style etc?

Appendix (II) : Samples of coding for the group discussion sessions

Excerpt of discussion of Group A (Session A-3-1)

- Members: *Yuet, Hei, Ho, Wan*
- Discussion topic: Article sequencing and page arrangement for their magazine "*Dissecting Hong Kong*"
- Third discussion taken place in March 2006 (at the project concluding stage)

	Dialogues in the discussion	Initial theme identification	Coding and categorizing		
			Role types	Discourse forms of cognitive reasoning	Conflict management
Yuet	How are we going to sequencing the order?	-Initiating discussion -Setting direction	Leader		
Wan	Let's talk about the page order. Yesterday when I was drawing the layout for my articles, I found the way of sequencing the 2-page and 3-page articles will affect the page design.	-Responding to question -Connecting to personal experience		Elaborative explanation: connect with prior knowledge	
Hei	I have drawn up my layout like this.	-Responding to question			
Yuet	What? What do you want?	-Asking for clarification		Exploratory questioning: seek clarification	
Hei	I suggest we design the page layout for our own articles.	-Explaining intention -Making suggestions	Initiator	Elaborative explanation: clarify misconceptions and add on new ideas	
Yuet	I have designed mine. I have used	-Self-defending		Exploratory questioning:	-Substantive conflicts

	circles to highlight the main body already. What do you want? Don't you think mine is not a proper design?	-Confronting *Hei*		challenge other's view	-Judgment negation and challenge
Hei	I am just trying to give suggestion. No need to react so strongly!	-Explaining position			-Resolving by Avoidance
Wan	I have designed for the restaurant feature article. In fact I have designed for two articles, but I think the restaurant one is more important.	-Changing to self-interest topic -Argument between *Yuet* & *Hei* withheld			
Yuet	Let's talk about the page sequence first. I think sequencing is more important. It will affect our …	-Setting direction again -Redirecting the group back to discussion	Leader		
Hei	Page design later on.	-Supporting -Supplementing			
Yuet	Look at it in this way, this way!	-Exerting authority	Leader		
Ho	Let me give you a pencil so that you can draw again. You can draw on this reused paper.	-Supporting by action -Showing interest to what *Yuet* said	Elaborator		
Yuet	Should the magazine be opened in this way or that way?	-Setting and proposing perspectives	Leader	Exploratory questioning: provoke thinking	
Ho & *Hei*	Should be opened in this way!	-Responding			
Hei	This is the cover.	-Further elaborating			

Yuet	Yes.	-Agreeing			
Ho	Write down the word "*cover*" on the page.	-Supporting -Supplementing			
Yuet	And then, then, ...	-Not sure what to do			
Ho	The Content Page!	-Filling in the "gap" for *Yuet*	Elaborator		
Yuet	Is the Content Page put here?	-Seeking confirmation		Exploratory questioning: seek confirmation	
Ho	The Editorial Note can also be put on this page.	-Responding -Supplementing	Elaborator	Elaborative explanation: elaborate ideas and opinions	
Wan	Have you thought of the design of the cover page	-Questioning by providing another perspective		-Exploratory questioning: Provoke thinking	
Yuet	We can decide when a special design comes up. I have no idea right now.	-Interrupting -Exercising authority	Leader		
Hei	Oh, if there is no special design idea, let's use this page.	-Responding -Solving problem	Initiator		-Substantive conflict -Resolved by problem Solving (proposing counterarguments and creative solutions)
Yuet	I am asking whether you have any special ideas.	-Exercising authority	Leader		
Ho	You can put the Editorial first, I guess.	-Responding, suggesting -Not confident	Elaborator		

Yuet	Editorial first or the Contents first?	-Seeking confirmation		Exploratory questioning: seek confirmation	
Wan	Editorial first.	-Echoing	Follower		
Ho	It's up to you. I think it is not important!	-Accommodating views -Not confident	Elaborator		
Hei	It seems that the Content is better to be put in this side.	-Inputting another view	Initiator		
Ho	Yes, putting at this side will make the Editorial look unimportant, I think!	-Accommodating views -Not confident	Elaborator		
Yuet	Probably!	-Endorsing			
Hei	It seems to be rather thin.	-Discussion going to no where			
Yuet	This page is Contents.				
Ho	This page is thicker.				
Hei	This is thicker, and the back cannot be used.				
Yuet	What will be the next article? Will it start with the article on the paper artworks?	-Setting perspectives -Managing discussion direction	Leader	-Exploratory questioning: provoke thinking	
Ho	Yes, the paper artwork article.	-Responding to question			
Yuet	How many pages for this article? You?	-Exerting authority	Leader		
Ho	Nine! Write it down, 9 pages, use "Z" to represent the word "paper", OK?	-Responding -Making suggestion			
Yuet	Why?	-Demanding clarification			
Wan	Ha ha! Why not draw a paper to replace the word "paper"?	-Loosening atmosphere			

Ho	More convenient! It is more convenient for you to write, because writing the word "paper" every time is very troublesome.	-Explaining reasons		-Elaborative explanation: elaborate ideas and opinions	
Yuet	As many as 9 pages?	-Demanding justifications		-Exploratory questioning: demand justifications or verifications	
Ho	Sure!	-Confirming			
Yuet	Congratulation to you, really!	-Loosening atmosphere			
Ho	Now you know how hardworking I am!				
Yuet	What follows? Who is next?	-Managing discussion Flow	Leader		
Hei	It is stapled!	-Discussion being side-tracked			
Wan	I help you to staple. I help you!				
Yuet	I staple! OK...., OK....				
Hei	It seems too big.				
Yuet	Please keep quiet! Continue to work! Who is the turn? Ha, ha, I am sorry!	-Resuming the discussion order	Leader		
Ho	You two are playing again!	-Discussion being side-Tracked			
Wan	I am not playing, I am listening seriously.				
Yuet	Who is the next?	-Redirecting the group back to discussion	Leader		
Hei	Whom do you want to be the next?	-Seeking clarification	Initiator	Exploratory questioning: seek clarification	
Yuet	What will follow the paper art article?	-Managing discussion flow	Leader		

Hei	Let's start from the part on "Head". We have talked about sequencing the pages according to the body structure, haven't we?	-Suggesting -Reminding	Initiator	Exploratory questioning: provoke thinking	
Yuet	Ah, yes!				
Hei	Then the highest part will be the "Eye"! Have you re-sequenced the pages?	-Suggesting -Reminding	Initiator	Exploratory questioning: provoke thinking	
Yuet	What about the part on "Eye"?	-Monitoring discussion	Leader	Exploratory questioning: eliciting information	
Wan	It seems to be different from what we have been talking last time.	-Implicitly commenting	Follower		
Ho	Shall we follow the order of importance or follow the order of body structure?	-Suggesting by asking		Exploratory questioning: provoke thinking	
Wan	But will the readers' attention not be sustained if the least important articles are put at the end? I mean, can the less important parts be put in the middle instead of at the end.	-Suggesting by asking		Exploratory questioning: provoke thinking	
Hei	What about following the order of explanation sequence?	-Suggesting another way of doing things	Initiator	Exploratory questioning: provoke thinking	
Yuet	I don't quite agree. Most magazines put the articles on the same page or column in every issue. It is quite constant. They won't change casually. The magazine that I often read is arranged like this.	-Disagreeing -Connecting with prior knowledge		Elaborative explanation: elaborating ideas and connecting with prior knowledge	

Wan	I agree.	-Agreeing	Follower		
Hei	Column order is of course constant in every issue.	-Refuting			
Wan	Do you mean we do not have to consider the content of the articles?	-Seeking clarification		Exploratory questioning: seek clarification	
Ho	Do you mean there are differences in the importance of contents for every article?	-Seeking clarification		Exploratory questioning: seek clarification	
Wan	But how are we going to judge the Importance? I want to ask.	-Evaluating *Hei*'s idea		Exploratory questioning: evaluate other's idea	
Ho	That is, judging by the quality of the information, and the quantity of the content.	-Trying to get an answer		Elaborative explanation: accumulation of reasoning and adding on new perspectives	
Wan	I think we should use this as criteria.	-Agreeing	Follower		
Yuet	Based on what you say, then Hei's song article is not so important.	-Making interpretation	Leader		
Ho	Is it that we shall use the body structure as our sequencing format?	-Making sure his understanding is correct		Exploratory questioning: seek confirmation	
Wan	We can't say body structure is not important.	-Supporting	Follower		
Yuet	May be less important, comparatively speaking.	-Intending to draw conclusion	Leader		
Hei	What criteria are you using when making	-Challenging *Yuet*'s		Exploratory questioning:	

	such comparison?	views		challenge other's views	
Yuet	I have no idea!	-No idea of how to solve the problem			
Ho	But we need to group the articles into certain categories.	-Reminding that the problem must be solved			
Hei	If we follow the body structure, then we may use "eye" and "ear" to categorizing the articles.	-Proposing a way to solve the problem	Initiator	Solving problem: sharing information and resources	
Ho	We might have to start with the ear and eye first, isn't it? Oh no, it should be eye, ear, mouth nose! Or, start with eye first, perhaps.	-Substantiating and elaborating on *Hei*'s idea	Elaborator	Solving problem: sharing information and resources	
Yuet	What do you mean by eye?	-Seeking explanation		Exploratory questioning: seek clarification	
Ho	As mentioned before, "eye" refers to the article on advertisements, "ear" refers to the song article.	-Providing further explanation		Elaborative explanation: elaborating ideas	
Hei	"Mouth" refers to the gourmet article. "Nose" refers to the Tai O article. Next is the hand and foot.	-Adding on further explanation		Elaborative explanation: accumulation of reasoning by adding on new ideas	
Yuet	I think this is not a good way to categorize the topics.	-Making judgment and drawing conclusion	Leader	Decision making: decision by averaging members' opinions	

Hei	So how are we going to categorize them?	-Seeking confirmation -Urging for conclusion	Initiator	Exploratory questioning: seek clarification	
Yuet	I still have vague idea. I just feel that …				
Hei	So what is your way of categorization then?	-Seeking confirmation -Urging for conclusion	Initiator	Exploratory questioning: seek clarification	
Yuet	It is my personal idea. That is ….. that is …., for those short articles, we refer them as "eye, ear, mouth, nose".	-Intending to make decision	Leader		
Hei	Do you mean by sequencing the articles by the order of importance?	-Seeking clarification		Exploratory questioning: seek clarification	
Yuet	Maybe the more important ones are placed first, and chiming in with those lighter ones.	-Approaching to decision making	Leader		
Ho	Does it mean to sequencing them in the order of "Light-heavy-light-heavy"?	-Seek confirmation		Exploratory questioning: seek confirmation	
Yuet	I think it is better to do it in this way. Not the "Light-heavy" way, nor "Heavy-light" model …	-Intending to draw conclusion	Leader		
Wan	Perhaps we can see what will the magazine look like if we follow our original order.	-Interrupting by suggesting another perspective			
Hei	Following our original order, it will be like that: advertisement 2 pages, then followed by the song article, then	-Supplementing		Elaborative explanation: elaborating ideas	

	followed by the 3-page gourmet article, then followed by the Tai-O article.				
Wan	Yes.	-Endorsing			
Hei	Let the "body", "hand" and "foot" be the next.	-Members adding on each others' ideas		-Accumulation of reasoning: adding on new ideas and perspectives	
Wan	Body, hand, foot, body, then followed by hand, and followed by foot!				
Hei	Body shall have 2 pages.				
Wan	"Foot" is the last part.				
Hei	That is right!				
Yuet	The last article should be the restaurant one.				
Hei	That is the order!	-Drawing conclusion	Initiator	-Problem solving: sharing information and resources, having a focus on problem solving -Decision making: decision by group consensus	

Appendix (III) : Samples of coding for the individual student interview

(A) Interview data for analyzing group roles

	Sayings in the interview	Initial theme identification	Roles Categorizing	Role expectation
Interview excerpt C-1: *Yi* **Group C, Co-Leader**	I could be considered as the co-leader. In fact *Shing* had also taken the initiatives in leading the group to discuss and think. I am an outspoken person, and like to talk much. I expected myself to take the leading role when I joined the group.	-initiatives, outspoken	Co-leader	-Matching with Expectation -Satisfied with role
	It was *Shing* and I who were the ones to make decisions. *Ting* acted as a balance. *Yin* was quiet. *Suen* acted as a teaser to stimulate us.	-*Shing* and *Yi:* making decision -others: balance, quiet, Stimulating	*Ting*: harmonizer *Yin*: Follower *Suen*: Initiator	
Interview excerpt B-5: *Yan* **Group B, Follower**	I was the kind of "handy man" who did trivial things for the group. I tended to follow what the others said. I am satisfied with my role for I considered myself a tension releaser for the members.	-following, doing non-major tasks	Follower	-Matching with Expectation -Satisfied with role
	Ma and *Suet* talked most in the group. *Suet* had a creative mind and provided a lot of ideas. *Ma* urged us to work, arranged work, planned schedules, and set direction for the group. *Ying* was like the cheering team, always told jokes to release our tension. *Yuen* was a supporter and follower. She seldom disagreed. She was rather quiet.	-*Ma*: talked most, arranged work, planned schedules, set direction -*Suet*: talked most, provided ideas -*Ying*: releasing tension - *Yuen:* support, follow, quiet.	*Ma*: Leader *Suet*: Initiator *Ying*: Harmonizer *Yuen:* Follower	

Interview excerpt A-2: ***Hei*** **Group A, Initiator**	I was neither the leader nor the follower. I was an active member who always took initiatives in discussions. I had many innovative ideas. Sometimes I would play the devil of advocate by arguing and opposing the other members' view. This was what I intended to do, and I felt OK for this kind of role.	-active, initiatives, innovative, disagreeing, arguing.	Initiator	-Matching with Expectation -Satisfied with role
	Yuet had the leadership ability, and took the leading role. She was important in monitoring the discussion flow, provoking thinking, interpreting and elaborating on our ideas. I always supplemented her views. *Ho* was neither the leader, follower, nor opposer. He executed work and more operational in his role. *Wan* did not talk much, but usually supplemented to what we said.	-*Yuet:* leading role, monitoring discussion, provoking thinking, interpreting and elaborating ideas -*Ho*: execution, operation -*Wan:* talk less, supplement	*Yuet:* Leader *Ho*: Elaborator *Wan:* Follower	

(B) Interview data for analyzing group conflicts

	Sayings in the interview	Initial theme identification	Coding for nature of conflicts	Coding for ways of resolving conflicts
Interview excerpt C-1: ***Yi*** **Group C, Co-Leader**	I couldn't recall any serious disputes occurring in my group. There might be some arguments about the ways to write an article or page sequencing etc, but they were minor and could be settled without much difficulty. It was often those calmer members, such as *Ting*, to say something as to arbitrate the arguing parties. Disagreement is not a bad thing. Without argumentation, there won't be stimulations for our discussions.	-only minor disputes on improving the quality of the project task -resolved by the arbitration -positive about group conflicts	Substantive conflict	Accommodating Compromising
Interview excerpt B-5: ***Yan*** **Group B, Follower**	I couldn't remember there was any serious dispute occurring in my group. If there were, they were just minor arguments on division of labour, workload, article submission deadline and so on. We didn't have hard feelings on each other. We might tease each other when the argument arose, but it usually ended up with amusing talks and jokes.	-only minor disputes on division of labour, workload, schedules etc -resolved by amusing talks and jokes -arguments did not lead to hard feeling	Procedural conflict	Avoiding Accommodating
Interview excerpt A-2: ***Hei*** **Group A, Initiator**	I couldn't recall any serious disputes occurring in my group. As far as I remembered, there were a few times when *Yuet* and I were arguing about the page layout and design for the articles. I made apology to her at that time. Disagreements in my group were not difficult to solve. We listened to each others' views and accepted the valid and reasonable ones.	-only minor disputes on page layout and design -resolved by apologizing and sharing of resources and views	Substantive conflict	Problem solving compromising

(C) Interview data for analyzing perceptions on group process

	Sayings in the interview	Positive or experiences	Less positive experiences	Perceptions of different stages	Gains from the group project
Interview excerpt C-1: ***Yi*** **Group C, Co-Leader**	It was a fantastic experience for us to interview the Air Auxiliary Force as a team. We were actually looking forward to the visit, and everyone was keen on taking up a part in the interview work. We were complementary to each other in performing our duties. That was our happy moment.	Visit to the Air Auxiliary Force: fantastic, looking forward to, keen, happy			
	At the first stage, as some members were not familiarized friends, the discussion flow was not as free and smooth as expected. The middle stage was better. We knew each other better, and so we could discuss in much more freely. The discussions were fruitful. The final stage was a difficult stage. It was time-pressing. We focused on the design and desktop publishing work. We worked together day and night, and each one had got a role. We were complimenting each other, just like a team of army, or a group of comrades. There were some disputes on the work at that time, but resolved, and our togetherness was even strengthened.		Disputes occurred but resolved, and group togetherness strengthened	-stage 1: discussion not smooth and free -stage 2: discussion freer and fruitful -stage 3: Team spirit, like army and comrades, group togetherness	
	I found myself talking too bluntly and too straight forward. I could not imagine the members who were not familiarized friends but could worked as a team harmoniously in	Team spirit, working harmoniously, group	Too blunt in communicating with members		-Acquiring software application skills

	building up the group togetherness, and launching the project with earnest and good team spirit. By the way, I had acquired the desktop publishing software because of the project work.	togetherness, work earnestly,			-Self realization: should improve communication skills
Interview excerpt B-5: ***Yan*** **Group B, Follower**	I felt the happiest when we were engaged in amusing dialogues like telling jokes and chatting on interesting topics. I liked the stage when we were doing the desktop publishing work in the computer centre. I like the feeling of striving hard together with the other teammates. I really like the feeling of working together.	-When chatting amusing topics and telling jokes -working together			
	We had spent much time in searching direction and familiarizing with each other at the first stage. The second stage was better as we always went for visit and interview together as a team. In my view, the final stage was the best. The load was heavy, but we were all very committed. Working as a team was much better than working by oneself. We worked together happily at that time.	Team spirit, togetherness, work as a team		-stage 1: searching direction, not familiarized with each other -stage 2: better team work -stage 3: committed, team spirit, happy	
	I am now less shy and brave enough to talk to people. I have got more friends. I like my group which is happy, interesting and united.	The group is happy, interesting and united.			-Attitude change: not as shy as before -Gaining Friendship

Interview excerpt A-2: ***Hei* Group A, Initiator**	Members in my group were quite average. It was a group with happy collaboration. I like our group discussions in which were earnest and serious but at the same with amusing jokes and innovative ideas. The interview experience with the Chinese traditional artwork master Mr. Yu, was great. It was very impressive and interesting. My happiest time was when my idea was accepted and commended by the other members.	-Interview with the Chinese traditional artwork master -the group discussion atmosphere -ideas being accepted			
	Work progress was slow and efficiency was low in stage one. Our work became smoother in the second stage. We felt very happy about the interview with Mr. Yu. The cover story was rather successful. The final stage was also good. It was the time when members had the most rigourous discussions and strongest team work.			-stage 1: low efficiency -stage 2: Happy, successful -stage 3: rigourous discussions, high team work	
	I may not have significant change or particular knowledge gain. But I am amazed of the high level of teamwork. Working as a team indeed can make something happen! I like my group as it is interesting, united, and with clear and fair work division.	-high level of teamwork -the group is interesting, united, and fair			Witnessing the power of teamwork

Appendix (IV) : Samples of coding for the personal reflective writings

(A) Data of personal reflective writings for analyzing group conflicts

	Sayings in the writing	Initial theme identification	Coding for nature of conflicts	Coding for ways of resolving conflicts
Writing excerpt C-4: ***Ting*** **Group C, harmonizer**	When I was a first year one student, the senior students shared with me various problems in doing the final year project, and one of which was the collaboration among group members. I can also understand the importance of collaboration. If members collaborate with others, work efficiency will be high, and the process will be happy. If members are not collaborative, then there will be hard feelings and the work will be affected. In fact I have never worked with the other members in my group. I know very little about *Shing* and *Yin*. Although I cannot say I could partner them immediately at the beginning, I can say our cooperation was smooth, and the experience was satisfactory. We offered mutual help to each other so to make the project work completed with satisfaction.	Prepared for group disputes and conflicts, but did not occur at all	N/A	N/A
Writing excerpt B-1:	We once had divergent views on magazine structure and interview contents. The disputes had hindered our work progress. But disputes also	-arguments related to quality of work -positive outcomes of	Substantive conflicts	Problem solving Accommodating Compromising

Ma **Group B, Leader**	brought to us new developments. Difference in ideas had brought to us creativity, innovations, and made our work even smoother than before. Arguments had let us know each other better. We had argued and with bad temper, and we felt at lost. But we understood and accepted that it was a one-time-off thing. We did not do it on purpose. So we resumed to normal. From that onwards, there was no secret and no hiding among us. I like this kind relationship which is so pure.	disputes: provoking ideas, knowing each other better, strengthening friendship		
Writing excerpt A-3: ***Ho*** **Group A, Elaborator**	I heard that there were disputes in the other groups, and making the members unhappy. I am really proud of my group being collaborating so harmoniously and happily.	No disputes and conflicts mentioned	N/A	N/A

(B) Data of personal reflective writings for analyzing perceptions on group process

	Sayings in the writing	Positive or experiences	Less positive experiences	Perceptions of different stages	Gains from the group project
Writing excerpt C-4: ***Ting*** **Group C, Harmonizer**	At the beginning I thought our magazine would be boring and serious task. However, later when our group members were getting more involved, and our discussions were getting more rigourous, my interest was aroused. I was particularly excited about interviewing the Air Auxiliary Force. … It was a fantastic experience which had broadened my perspectives and made me learn a lot. I treasured this interview event. …… It was most excited in the final stage. … We worked day and night. But I enjoyed the feeling of rushing work and competing with time together with my groupmates. Whenever I saw the members of my group and the other groups striving hard with our projects in the computer room, I felt we were a team with a common goal, striving for the same destiny.	-interest aroused, -fantastic and excited experience -broaden Perspectives -learnt a lot -enjoyed -striving for common goal	Feel bored at the beginning, but arousing interest later on	-stage 1: less involved, feeling bored -stage 2: involved, committed, interested, excited experience -stage 3: striving hard as a group, hard work but enjoyable	-Broadened perspectives -learnt a lot
	I do appreciate our project outcome. I regret on not having written personal features. But I also understand that as there are not so many personal features in a magazine, so not everyone could have a chance to write one. Now we have finished our task. I feel a bit	-appreciate the outcome -team work -working for common goal and solving problem	-regret for not writing personal feature, but understand the limitation		Self-realization: Prone to working as a team

	lost. I really like working as a team, which enables the whole group to strive for a common goal and to solve problems together. This collaborative experience was an unforgettable memory for me.	together -unforgettable experience			
Writing excerpt B-1: ***Ma*** **Group B, Leader**	I am a shy girl. … I am afraid of saying wrong things. I feel anxious when talking to strangers. Doing the project had given me a good chance to practice, making me more open in talking and interviewing people. I tried, not afraid of making mistakes, and as a result we have successfully done more than ten interviews. At the beginning of the project process, I had to prepare for sitting the language proficiency test. I worried for the project. I worried for my members not knowing how to handle the work. But in fact they had shared my load. Their mutual help had let me understand that members need to be given a free hand to learn to work on their own. I and my members had become more mature in this incident. I had encountered many happy moments in my group. I liked *Ying's* jokes very much. She told jokes and amusing stories in our discussions, making us happy everyday. … The project has completed, but our friendship will never end. We shall be good friends forever!	-interviews were successfully done -mutual help among members -happy moments of sharing jokes and amusing stories -friendship forever	Worry for members' ability, but resolved by members' mutual help	N/A	-attitude changed: braver and less shy -self-realization: give free hands to members -gaining friendship
Writing	We had started our project planning from	-happy	N/A	N/A	-Preparation for

excerpt A-3: ***Ho*** **Group A, Elaborator**	Christmas last year. The process was so happy that I have not realized time is running so fast. The working principle of my group is working with happiness. We treated the site visit to Tai-O as going for a picnic. We interviewed people and then made friends with them. … We felt relaxed and happy in doing all these project work. …… We The interview experience is very treasurable. It will be beneficial to our future career.	-enjoy doing the work -make fun from the work -relaxed -treasurable experience -beneficial to future career			future career -making more friends